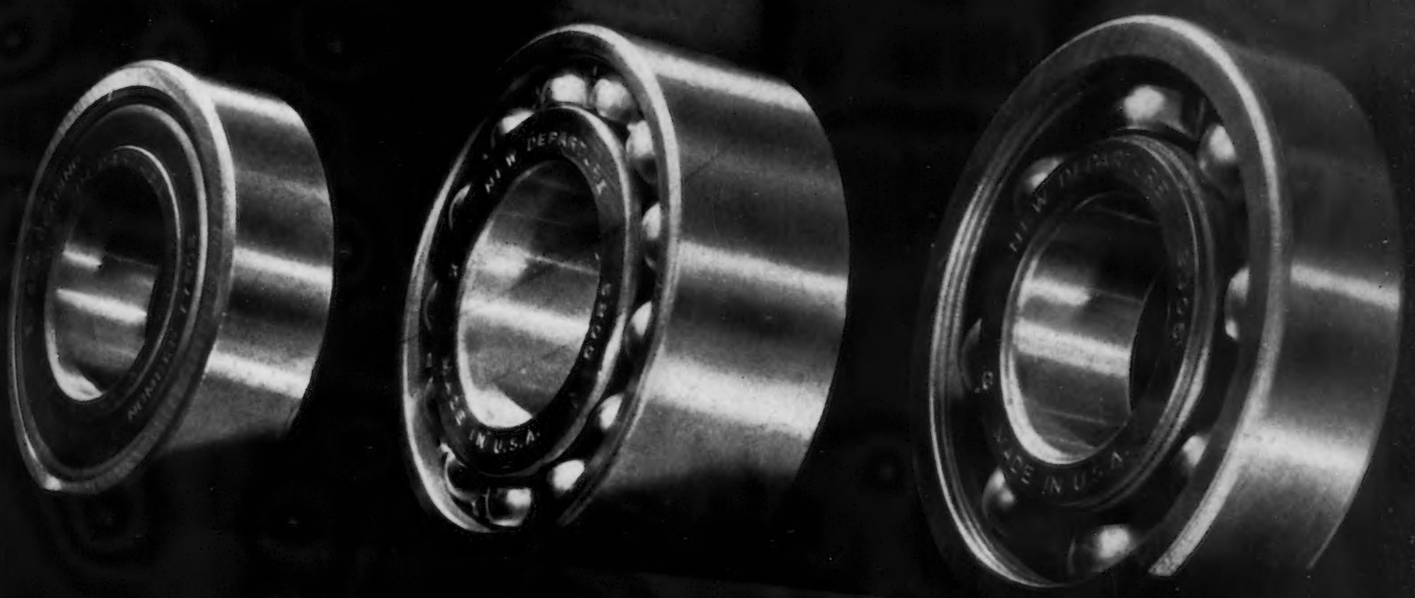
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The IRON AGE

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NOVEMBER 20, 1941
VOL. 148, NO. 21

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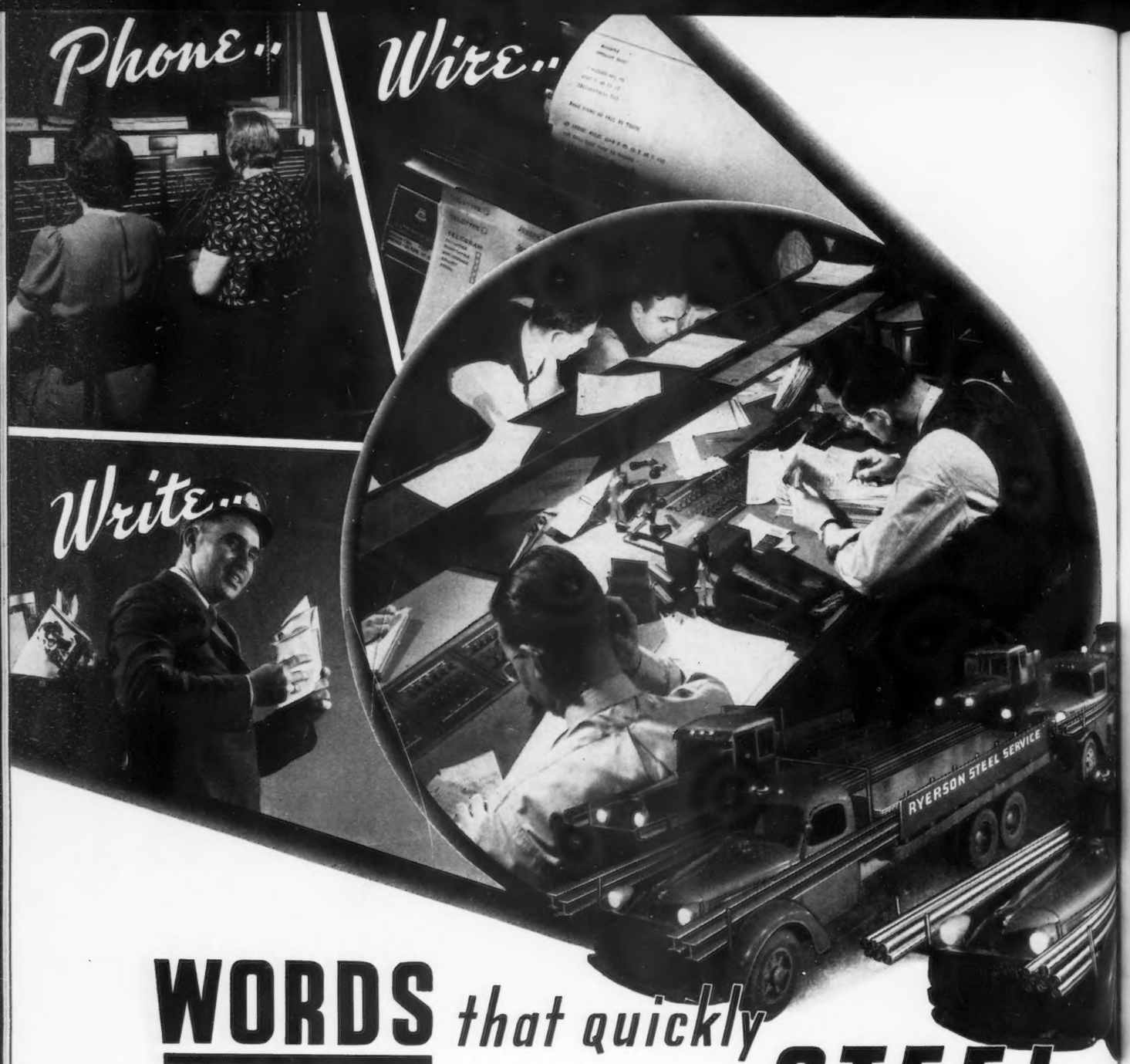
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THE IRON AGE

NOVEMBER 20, 1941

ESTABLISHED 1855

Tomorrow's Sales Today

THE head of one of our New England metal working concerns recently asked me a question. He was perplexed and troubled, as many manufacturers all over the country are, and he wanted advice as to his merchandising policies.

"What kind of publicity should I put out," he asked, "during this sellers' market?"

I asked him, in return, whether he intended to keep his company in business after the war, or to call it a day and retire gracefully on his profits, if any, after the duration.

Of course, I knew how he would answer that one and he did so in just the way that 999 out of 1000 manufacturers would. You would answer it that way too, so I do not need to tell you what he said.

So then, I asked him to tell me how long, in his business, it took to make a sale in normal times when there really was selling to be done and it wasn't all buying. What period of time, in other words, would ordinarily elapse between the original implanting in the buyer's mind of the product idea and the eventual signature on the dotted line.

This gentleman was a maker of machinery, and as you know, capital goods sales in normal times are not pushovers. They take a lot of selling.

After some thought, my friend ventured to guess that his average sale required about two years to mature and that in some cases it was three or four years, this of course with new customers.

So I said to him that inasmuch as he intended to stay in business after the war and since the sales seeds took so long to germinate and ripen, his present day sales effort should be directed toward selling two to four years hence, by which time the war would probably be over and he would need a lot of new customers.

I think that, by and large, this same thing is true for most of the capital goods made in the metalworking industry. The big sales promotion job of today is to lay the foundation for demand for your product after the war.

Can demand, or rather product acceptance, be created and put in dry ice to be thawed out later when needed? Surely it can. You were probably sold on your first automobile, as I was, a year or two before you had the money with which to buy it.

J. H. Van Deventer

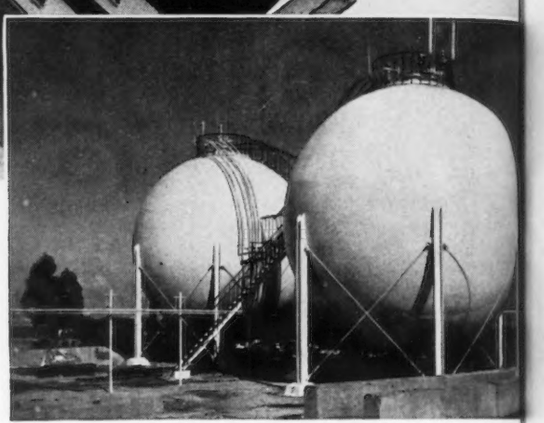


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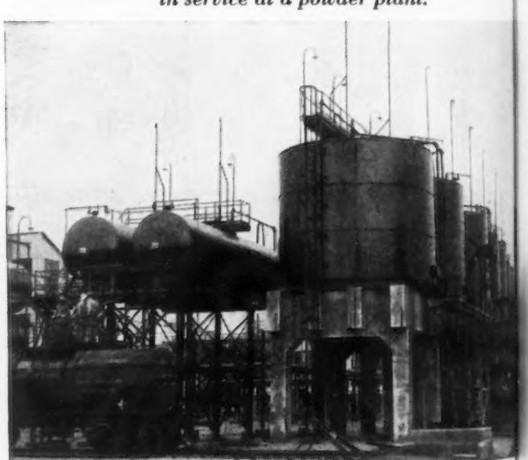
Combat tanks are, of course, a vital necessity for modern warfare. But they are not the only tanks. There are others — tanks which will never cross a battlefield, nor be featured in the headlines, or in picture magazines. These tanks are also vital for America's defense.

Filled with gasoline or oil at our off-shore bases, carrying the water supply high above ground at army camps, bearing important chemical solutions at scores of new defense plants — thousands of these tanks are playing their nonspectacular but essential part in our country's great defense program.

For their construction, Inland is regularly producing large tonnages of plates and other steel products. Just as for bomber plants—and ships—and shells—and countless other defense requirements, Inland is bending every effort to deliver steel for these tanks when and where it is needed. For National Defense is Inland's No. 1 Job!



Two 25,000-bbl. pressure tanks built of Inland Steel in service at a powder plant.



Acid for the production of explosives is stored in these tanks at an Army Ordnance Works. Inland Steel was used for their construction.

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Casting Pit Refractories

By J. H. CHESTERS
Central Research Department.
United Steel Companies, Ltd.,
Sheffield, England



FIG. 1—Tapping the metal from an 80-ton open-hearth furnace into the ladle.

THIS first of two articles on basic casting pit refractories continues the discussions on basic open hearth refractories that have appeared in THE IRON AGE, issues of Aug. 15 and 22, 1940, Feb. 6 and 13, May 22 and 29 and Aug. 7, 14, and 21, 1941. The article herein deals with the refractories used in ladle and ladle accessory construction.

FEW ceramic experts confronted for the first time with the problem of lining a ladle to hold 80 tons of molten steel at a temperature of over 2912 deg. F. would dare to specify the use of a ladle brick of refractoriness of only 2768 deg. F. Yet ladle brick of this type does in fact give excellent service both in the United States and in Great Britain. A study of their properties and of those of other casting pit refractories reveals a number of peculiar characteristics, for example, the tendency of the siliceous ladle brick to "bloat" on re-firing, which help to explain its popularity. As a result of such investigations, the author is of the opinion that more progress can be made at the moment by a study of the properties of successful casting pit materials than by a great deal of theorizing.

In the works of United Steel Companies a detailed survey was made in 1938 of all the main brands of casting pit refractories in use and this has proved invaluable, if only as a standard by which subsequent deliveries could be judged. Thus, spalling was experienced with a particular mold top brick under normal service conditions, and tests made on samples from the same delivery showed that the thermal shock resistance had fallen considerably below the survey figure. Further comparison of the porosity, permeability and X-ray diffraction spectra showed that this loss of thermal shock resistance was associated with over-firing. Indeed it appeared that the firing temperature had gone up from about 2282 to 2552 deg. F. This most unusual increase in firing temperature was subsequently confirmed by the supplier and the goods concerned were replaced. It will be seen, therefore, that the testing of casting pit refractories not only explains certain works difficulties, but enables suggestions to be made as to how such difficulties can in future be avoided.

Some idea of the cost side of the problem can be gathered from the fact that in one works where over 80 per cent of the steel made is bottom poured, the cost of casting pit refractories is about 75c. per ton of steel produced as compared with only 60c. for all the other open hearth furnace refractories. Equally important, though little understood, is the influence of the quality of casting pit refractories on the cleanliness of the steel.

Ladles

On leaving the open hearth furnace the steel rushes down the launder into the ladle. The sight is a pleasant one to everyone except the ladle brick manufacturer, who

has to provide a product that will not only withstand the sudden impact of molten steel, but also a prolonged "stewing" in contact with slag and metal (Fig. 1).

A—Construction:

Ladles vary greatly in their capacity, but for most open hearth work a 60 to 100-ton size is normal. In general the ladle is round but in certain works where additional ladle capacity has been essential and an increase in the width of the ladle has been undesirable, oval ladles are employed. The refractory problem is essentially similar in both cases, though more difficulty is found with the oval ladle in keeping the brick in place. A typical ladle lining arrangement is as follows: (1) 2-in. splits at the back as a safety course; (2) 4½-in. squares built on end; that is, with a 9 x 3-in. face toward the steel; and (3) 6-in. blocks for the lining of the bottom section.

Such a layout for an 80-ton ladle is shown in Fig. 2. Since the steel on leaving the launder hits the same area of the ladle during each cast, this section, known as the striker patch, is generally made considerably thicker than the rest of the ladle. The brick may be set in rings one above the other, or may be built as a continuous spiral. With the former arrangement, "piecing-up" must be done in finishing each ring while with the spiral arrangement the construction of the first ring, which tapers from zero to one brick thickness, is rather difficult.

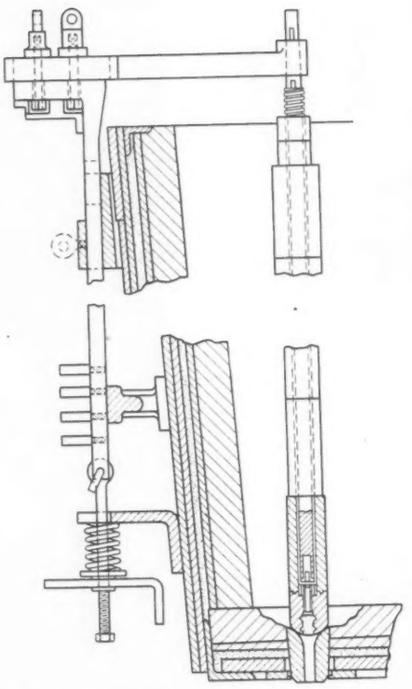


FIG. 2 — Stopper rod arrangement and ladle lining for an 80-ton ladle.

Good shape is essential with ladle brick, since the joints tend to be the weakest part of the lining. Generally the shape and brick laying are so good that it is difficult to insert a pen knife blade between the bricks. Rammed (monolithic) ladles, made, for example, with a sand-clay mixture, are used considerably in continental Europe but are not common either in the United States or in Great Britain.

Adequate drying of the ladle prior to use is essential. The time taken to dry, either with coal or coke braziers or with gas flares, varies greatly from plant to plant, being as short as 45 min. and as long as 24 hr.

B—Materials:

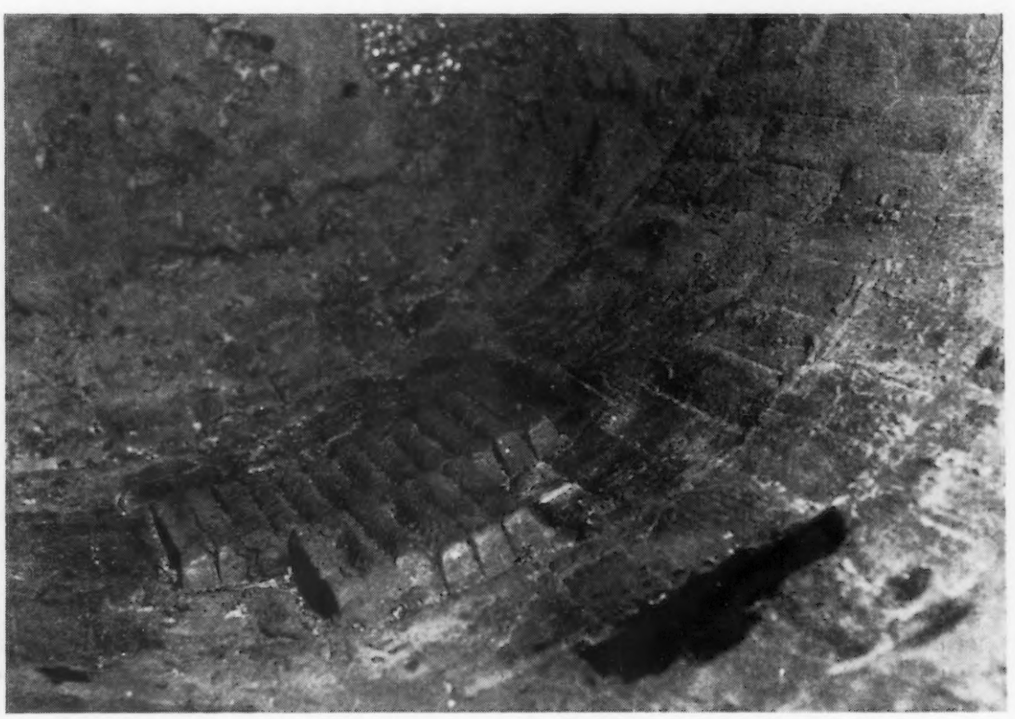
Fireclay brick.

Two main types of fireclay brick are employed, namely, (1) siliceous fireclay brick of relatively low melting point, and (2) medium or high alumina brick (usually 35 to 42 per cent Al_2O_3) of 3002 deg. F. refractoriness and over. Until recently, brick of the first type was used almost exclusively for the lining of steel plant ladles, but more recently brick of the second class has tended to replace the "potty" type siliceous brick. As already stated in the introduction, the success of the first type is rather anomalous. Its melting point is often only about 2732 deg. F. while its chemical analysis shows an alumina content of about 28 per cent, iron oxide 3 per cent, alkalis 3 per cent, and titania 2 per cent. On the other hand the porosity of such brick is often less than 15 per cent and its permeability ex-

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FIG. 3 — Plumbago bricks standing "proud" at the conclusion of the comparative trial against fireclay bricks. (Medium alumina.)

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tremely low (0.002 units). The after expansion on re-firing for 2 hr. at 2570 deg. F. on one such American brick was over 30 per cent!

Test methods used are described in THE IRON AGE, Feb. 6 and 13.

The properties of the two types of brick are compared in Table I. The bricks marked F.34 and F.32, the first low alumina and the second medium alumina, represent the ladle brick most used in one United Steel Companies plant, and are found to give approximately equal service in spite of their very different properties. More recently the brick F.33 has given better results than either of the above brick, due, it is believed, to its greater refractoriness combined with density of texture.

Ladle brick affords a good illustration of the fact tnat the properties required in a refractory are essentially a compromise. Thus, high refractoriness tends to be associated with high porosity since a refractory clay requires a higher temperature than a siliceous clay to induce vitrification. It is because very special manufacturing technique is required to produce brick of medium or high alumina clay with as dense a texture as that readily obtained with a low alumina clay, that the advantage of the higher refractoriness has not been felt except in more recent products. Such low porosity and permeability can also be obtained by fine grinding, combined with de-airing of the clay either during extrusion or in the press box.

The importance or otherwise of high refractoriness under load is not clear, although the abrasive action of the swirling metal clearly makes toughness at the working temperature a desirable property. The melting point is important, not so much for its own sake but rather because brick having a high melting point has also a high tolerance for basic slag. After-contraction must be carefully watched with the more refractory brick, which tend to shrink rather than bloat, since such shrinkage will result in premature attack at the joints. With the siliceous type of brick, trouble is rarely experienced with joints, since the surface of the brick softens and an almost continuous vitrified face is obtained.

The future would seem to lie with a ladle brick made from a very refractory clay, say over 3110 deg. F., finely ground, heavily pressed

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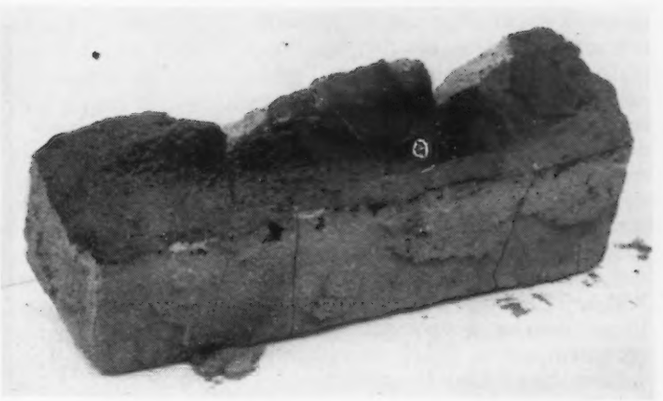
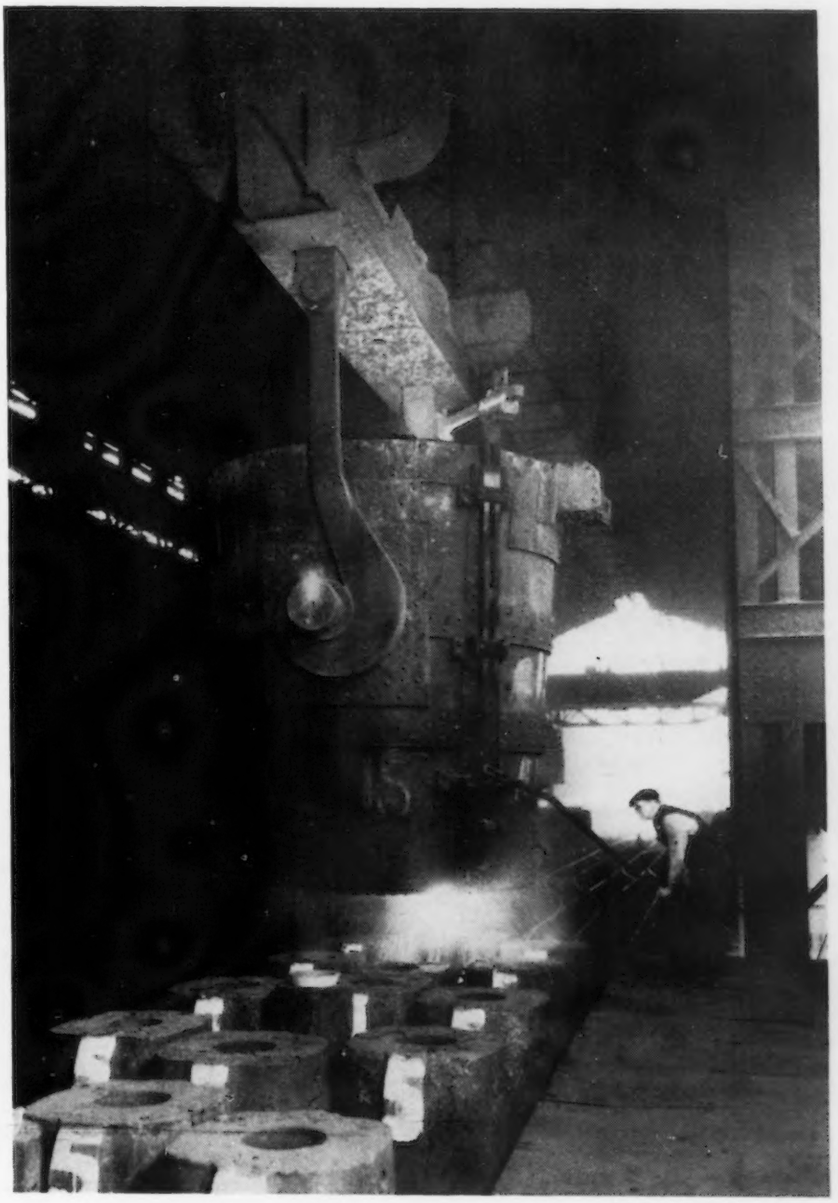


FIG. 4—This used ladle brick shows the excessive attack on the cored or "black-hearted" portion.

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BELOW

FIG. 5—Teeming from the ladle into the trumpet of a bottom-pouring arrangement.



and well fired. Because of the high refractoriness it should be possible to make such brick without any serious loss of thermal shock resistance. In this connection, it may be stated with some degree of certainty that a thermal shock resistance of 10 reversals is adequate for ladles. That such a trend is not purely academic is shown by the fact that preliminary trials of the F.33 brick showed a saving of about 15 per cent or 2c. per ton of steel produced.

Plumbago (Clay-Graphite) Brick.

Of the dozens of trials made during the last few years in steel plant ladles by far the most surprising and encouraging was that obtained with plumbago brick. This brick, which is made by firing a mixture of about 70 per cent of medium alumina clay with 30 per cent of high grade flake graphite were first tried one or two at a time and then as a panel of a few hundred brick. They wore back at a negligible rate compared with that of the surrounding fireclay brick (see Fig. 3) and this led to trials of complete ladle linings. Difficulties are still being experienced in finding a cement that will stand up as well as ladle brick itself, while the use of cement high in graphite for patching work may lead to dangerous frothing of the slag, but since the probable life of such linings is several times that of the ordinary fireclay brick, this field of possible development is clearly worthy of further investigation.

Rammed Ladles.

Considerable use has been made in continental Europe of rammed ladles, the material employed being the naturally bonded fine grained sands known under the general title of Klebsand. It is understood that from the cost point of view such ladles are very satisfactory and that they offer the following advantages: (1) Joints are eliminated; (2) the siliceous batch tends to have a positive expansion on firing, which minimizes cracking, and (3) a good glaze is readily obtained on the working face.



FIG. 6—Nozzle, stopper and rod cover for an 80-ton ladle.

Basic Ladles.

Since basic open hearth steel is made on a basic bottom it is natural to assume that it could best be poured from a basic lined ladle. Such a ladle should not only show greater durability but might also interfere less with the quality of the steel. Thus the re-phosphorization that occasionally occurs in the ladle might be avoided. Chrome-magnesite brick has been tried for the lining of ladles and there is no doubt that a considerable increase in life can be obtained in this way. However, until more can be demonstrated regarding the influence of the ladle lining on the cleanliness of the steel, it is doubtful whether the additional cost can be justified.

The use of dolomite either in the form of fired or unfired stabilized dolomite brick or as "basic," that is, dolomite calcined at a high temperature without additions, is per-

TABLE I—Properties of Ladle Brick

	Low Alumina Type		Medium Alumina Type			
Code No.	F.17	F.34	F.12	F.2	F.32	F.33
Apparent porosity, per cent	23.7	18.7	18.2	21.7	13.7	17.0
Bulk density,						
gm. per c.c.	2.00	2.05	2.11	1.98	2.00	2.17
lb. per cu. in.	0.7222	0.7403	0.7619	0.7150	0.7222	0.7836
Cold crushing strength,						
lb. per sq. in. (on end)	6910	3140	—	4140	3530	4190
Permeability to air, c. g. s. units, perpendicular						
9 in. x 3 in. face (1 skin)	0.0036	0.0036	0.0084	0.013	0.014	0.046
After-contraction (—)						
After-expansion (+)						
2 hr. 2570 deg. F.	+ 3.6 per cent	+ 3.6 per cent	— 0.7 per cent	— 0.6 per cent	— 1.4 per cent	— 0.3 per cent
Refractoriness under load (50 lb. per sq. in.)						
Initial softening	1850 deg. F.	2012 deg. F.	2462 deg. F.	2228 deg. F.	2102 deg. F.	2372 deg. F.
Rapid softening	2588 deg. F.	2516 deg. F.	2624 deg. F.	2642 deg. F.	2552 deg. F.	2624 deg. F.
Fail or 10 per cent collapse	2768 deg. F.	2768 deg. F.	2768 deg. F.	2804 deg. F.	2822 deg. F.	2912 deg. F.
Cone melting point	2822 deg. F.	2876 deg. F.	3092 deg. F.	3056 deg. F.	3056 deg. F.	3110 deg. F.
Thermal shock resistance	12	19	13	30 +	30 +	30 +

haps more promising. Stabilized dolomite brick tends to have a high spalling tendency and a higher conductivity than fireclay brick, which might result in increased skulling, but these difficulties may well be overcome and the issue will then be largely one of comparative costs.

C—Life and Causes of Failure:

Among the factors influencing ladle life are the following: (1) The depth of slag on the metal in the ladle, which may vary from 0 to 3 ft.; (2) the nature of the slag, that is, its basicity and FeO and MnO contents, and (3) the time during which the metal and slag remain in the ladle, which may vary from a few minutes to as much as 1 hr.

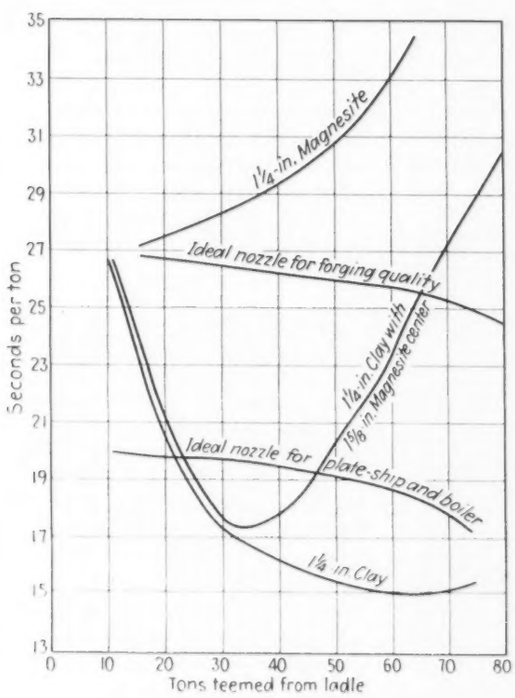
The life actually obtained with a ladle lining is about eight to 14 casts with basic steel, and hence ladle brick represents a considerable item in refractories' costs. In the United Steel Companies works, it amounts to about 12c. per ton of steel produced and hence an increase in ladle life of one cast means a saving of about 1c. per ton of steel produced. In the acid open hearth shop, the attack on ladles is much less severe, the ladle life being about twice that obtained in the basic open hearth plant.

Comparatively little fundamental work has been done as yet on the erosion and corrosion of ladle bricks, but it is already clear that the wear, which tends to be a maximum at the slag metal interface, is due to the slag rather than to the metal. Salmang has put forward the interesting idea that the wear can be estimated in terms of the individual oxides in the slag. Thus, he considers that most of the attack on a firebrick is due to the basic oxides, that is, FeO, MnO and CaO (see slag analyses, basic open hearth section of this series of articles). Another factor known to have a marked effect on ladle life is the content of fluorspar in the slag, but by far the most important factor seems to be the *amount* of slag cover on the metal. Thus, with the ladles used to take the metal from large tilting furnaces, there is practically no slag covering, and a life of about 30 casts is expected. The main hindrance to a fundamental study of the problem is that a ladle is rarely used continuously on one quality of steel and slag and even if it is, a comparative trial on another brick under similar conditions is difficult to arrange. The field is one in which statistical analysis might enable more progress to be made. In the meantime it can only be said that such conditions as a succession of low carbon effervescing steel casts with heavy slag cover do result in excessive wear.

Melting point determinations of slag-fireclay brick mixtures show an almost linear drop in melting point with the percentage slag addition, at least in the early stages. Since the curves obtained with bricks of varying refractoriness are essentially parallel for moderate slag contents, it would appear that chemical slag resistance is directly connected with the initial refractoriness of the fireclay brick. That is, that other things being equal, a brick of high refractoriness will have a greater slag resistance than one of low refractoriness. Premature failure of ladles may occur due to: (1) Inadequate drying of the ladle, which in extreme cases may result in an explosion; (2) the presence in the ladle of "black-hearted" or cored bricks, that is, bricks which have been fired too rapidly or in too reducing an atmosphere for the carbonaceous material to be eliminated before vitrification sets in. It is found that such bricks wear normally until the white skin has been penetrated but immediately the slag reaches the black heart, the wear is abnormally accelerated and a localized break-through may occur, and (3) heavy skulls caused by the use of relatively cold metal or a long casting period, which cause damage to the lining during their removal.

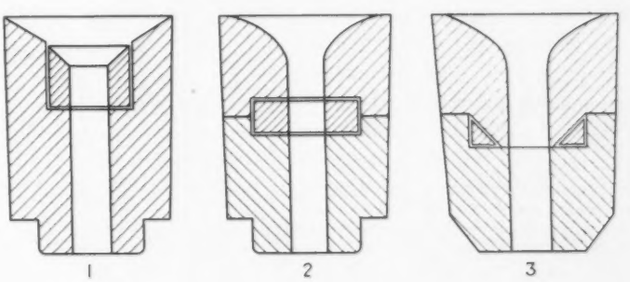
D—Lines of Improvement:

The following are suggested as possible lines of future development: (1) The use of even denser fireclay brick of high alumina content; (2) the use of plumbago bricks together with a more suitable cement, and (3) the use of monolithic linings made either from "basic" or from stabilized



LEFT

FIG. 7—Influence of nozzle type on teeming speeds of similar steels.



ABOVE

Fig. 8—Various designs of magnesite inserts.

dolomite clinker rammed in place with a suitable bond.

Nozzles and Stoppers

The casting of steel from a ladle can be done by tipping the ladle and pouring over a spout, but with large ladles it is almost always done by having a nozzle in the base of the ladle which can be closed by means of a stopper, the latter being fixed on the end of a steel rod that can be operated from outside (Fig. 5). It is arranged that the area around the nozzle slopes downward so as to facilitate draining. Since both the nozzle and the stopper not only have to stand up to erosion and corrosion by swirling metal, but must maintain their strength at high temperature, they must clearly have superior properties. A study of the data given in Table II shows that in fact, both as regards refractoriness and density of texture, nozzles and stoppers are probably the highest grade of all casting pit refractories.

The properties of the ideal nozzle have been aptly described by Dodd and Green who stated: "Briefly, the perfect nozzle would permit the teeming of the entire cast of steel at a constant rate without splashing on to the sides of the ingot mold and without contaminating the metal; the nozzle would also maintain a perfect seating for the stopper head so that no dribbling would occur while the ladle was being moved from one mold to the next."

Numerous methods are employed for fixing the stopper end on to the mild steel stopper rod, as for instance both the rod and the fireclay stopper may be threaded or the end of the rod may be threaded and a nut inserted in a hole passing through the stopper. In this latter case the hole must subsequently be filled with refractory material to avoid overheating of the rod end. Often the stopper is held on by means of a short bolt, as in Fig. 2, which passes through it and is fixed to the stopper rod by means of a cotter pin.

Satisfactory types are now available which enable solid stoppers to be used, one such type involving the use of a small fired clay insert placed in position after the rod has been inserted and rotated. In this case the stopper is held in position by a sideways projection on the end of the stopper rod which locks under a flange in the stopper when set in one particular position. The steel rod itself is protected by means of rod covers or ladle sleeves which will be discussed in some detail in the next section. The nozzles used vary widely both in design and dimensions. Thus, different firms prefer different curvatures of the working face. Whatever the latter may be, the essential point to be watched is that the stopper end seats well on the nozzle top and that such wear as does occur does not prevent a proper shut-off from being obtained.

Jigs are often used to insure proper alinement of nozzles, and reasonable steel tightness can be tested for by placing fine sand in the nozzle after the stopper has been closed and seeing if it runs out. If in this test the fit is not satisfactory, some grinding may be necessary. The properties of the nozzle and stopper are most important since if they do not function properly, an otherwise perfect cast of steel may be spoiled. A steady stream is required to avoid splashing and to give a constant rate of teeming factor. The latter has a considerable influence on the ingot structure and on the amount of non-metallic inclusions trapped in the steel.

The rate of teeming can be controlled to a considerable extent by the choice of a suitable size of nozzle but unfortunately the wear on the latter is rarely such as to compensate exactly for the drop in ferrostatic head in the ladle, and hence the rate of pouring may vary considerably during the cast. Much can be done to improve matters by manual control, that is, by lifting or lowering the stopper head, but the use of a nozzle which when full open gives the correct rate through-

TABLE II—Properties of Nozzles and Stoppers

	Nozzles		Stoppers	
	A	B	A	B
Apparent porosity, per cent	21.3	25.2	16.4	16.9
Bulk density,				
gm. per c.c.	2.09	2.00	2.17	2.14
lb. per cu. in.	0.7547	0.7222	0.7836	0.7728
Apparent specific gravity	2.65	2.67	2.59	2.58
Permeability to air, c. g. s. units	0.0004 (1 skin)	0.0034 (1 skin)	0.0003 (1 skin)	0.0015 (1 skin)
After shrinkage (—) or expansion (+) per cent, 2 hr. at 2570 deg. F.	+ 5.3	+ 0.7	+6.4	+7.0
Refractoriness under load (50 lb. per sq. in.)				
Initial softening	2066 deg. F.	2192 deg. F.	2030 deg. F.	2012 deg. F.
Rapid softening	2570 deg. F.	2426 deg. F.	2516 deg. F.	2372 deg. F.
10 per cent deformation	2696 deg. F.	2768 deg. F.	2768 deg. F.	2678 deg. F.
Thermal shock resistance, 1652 deg. F. test	3 x 2 x 2 in. section 4, 5 average 5	3 x 2 x 2 in. section 30+, 11 average 21+	3 x 2 x 2 in. section 25, 27 average 26	3 x 2 x 2 in. section 30+, 21 average 26+
Cone melting point	3092 deg. F.	3146 deg. F.	3146 deg. F.	3128 deg. F.
Free quartz, per cent. Estimated by microscope	4	2	4	2
Chemical analysis:				
SiO_2	54.26	54.61	54.34	53.31
FeO	3.20 (Fe_2O_3)	2.18	3.76 (Fe_2O_3)	2.70
Al_2O_3	38.82	38.99	38.80	39.68
TiO_2	1.26	1.40	1.18	1.50
CaO	0.20	0.04	0.52	0.04
MgO	0.94	0.83	1.02	1.10
Loss on ignition	0.26	...	0.32	...

out the cast would be much more desirable and this can to a certain extent be approached by the use of magnesite inserts (see Fig. 7). If no wear took place, the rate of flow from the nozzle would be proportional to the square foot of the ferrostatic head in the ladle, a condition which is closely approached when magnesite nozzles are employed, but which involves certain serious disadvantages.

Most British nozzles are made from a high alumina, 40 per cent Al_2O_3, clay. The batch is frequently de-aired and the result is a dense product of low permeability and good thermal shock resistance. The firing temperature employed is generally considerably higher, about 2372 deg. F., than that used say for rod covers, which is from 2012 to 2192 deg. F. for hollow ware.

The properties of a number of typical nozzles and stoppers are given in Table II. It will be seen that all the samples tested had a bulk density of 0.72 lb. per cu. in. (2 gm. per c.c.) or over and an unusually low permeability. As would be expected from their analyses, the melting points are 3092 deg. F. or over, while their refractoriness under load is equal to that of most good fireclay brick. The stoppers in particular show a good thermal shock resistance which is highly desirable since they are heated up rather rapidly by means of a small fire or gas flares prior to the tapping of the steel into the ladle. Cracking of nozzles or stoppers is generally associated with over-firing but may also be due to making faults.

It has sometimes been suggested that the use of different materials for stopper and nozzle is desirable. Thus a plumbago stopper end can be used with a clay nozzle or a tarred nozzle can be used with an untarred stopper. Tarred nozzles have been found much less liable to split, while the risk of nozzle and stopper sticking together is greatly reduced. The use of clays of different refractoriness has also been suggested, but in United Steel works the properties of nozzle and stopper are essentially similar. According to Hite and Callinan, a general purpose nozzle in the United States has a refractoriness of Cone 16/27 and a porosity of 10 to 20 per cent, while special purpose nozzles, including plumbago, are of much higher alumina content, for example, those made by simultaneous addition of alumina and feldspar to a high grade fireclay show marked possibilities.

Magnesite nozzles are sometimes used but they possess certain disadvantages, for example, low thermal shock resistance and high conductivity, and hence composite nozzles made from fireclay but containing an annular magnesite insert are more useful. Some of the different types employed are illustrated in Fig. 8, while the influence of the insert on the tapping rate is shown in Fig. 7. The design should be such as to permit of accurate assembly of the composite nozzle, and the risk of the insert or the top half of the nozzle sticking to the stopper end and being lifted with it, should be borne in mind.

Ed. Note: In concluding this article next week, the author considers the construction of ladle sleeves, trumpets and guides, and discusses runner, center and mold top bricks, tundish tiles, and non-metallic inclusions in steel.

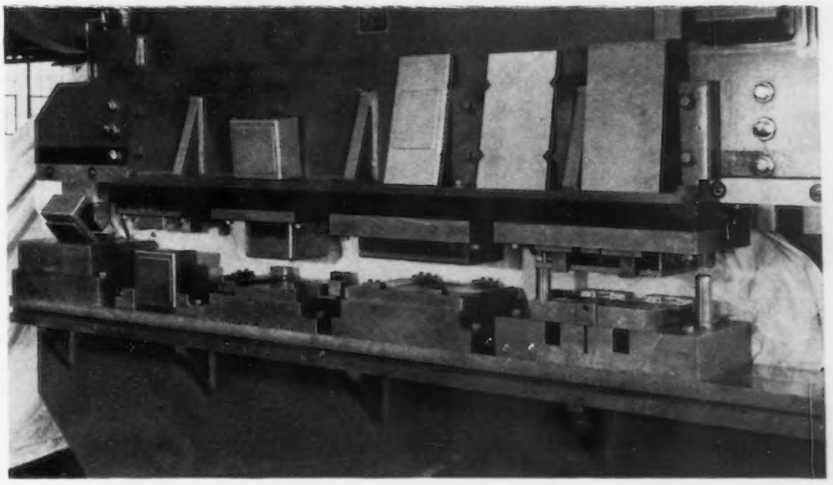
Progressive Operations on a Bending Press

NECESSITY in war requirements has stimulated the use of new methods and substitute materials, with sometimes surprising economy. The accompanying illustration, for example, shows how a series of blanking and forming operations are performed in a press brake on steel of non-drawing quality to make a box that had been a zinc casting before. In fact, the stock available was ordinary commercial grade, with a rather wide variation in gage thickness.

The bending press used is a model B-6 Sturdybender, manufactured by Cyril Bath & Co., Cleveland, and the same firm designed and built the dies shown. The substitute box was designed, and the dies and machinery built and put in operation within 60 days.

The first operation is to blank and pierce the piece; the second, to emboss the forward face of the box and turn up the flanges on the side; the third, to bend up the two ends; the fourth, to form protrusions on the flanges for later resistance welding on of the side walls of the box, and finally to true up the corners. Safety devices, not shown, were later added to the press. One operator produced 35-40 boxes per hr. in tryout.

The advantages claimed for this set-up are: First, the design avoided the need of special drawing steel, since the difficult corner drawing is eliminated; second, the box was completed in the hands of one operator without being put down or conveyed to another press, with a marked saving in handling time; third, the floor space requirements were less than if the work were done on a series of separate presses, and fourth, the cost of operating with one 5-hp. is materially lower than if the work were done on a series of presses. A further advantage is that the dies used are less costly than draw dies.



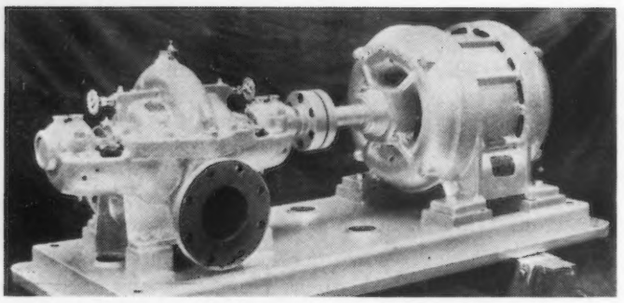


FIG. 1—Flanged bolt holes and the formed drip lip, both standard construction, give added strength and rigidity to this welded steel base for a 5 x 5-in. centrifugal pump.

Baseplates of Welded Steel

By M. L. MURDOCK

Engineer, Hydraulic Department, Allis-Chalmers Mfg. Co., Milwaukee

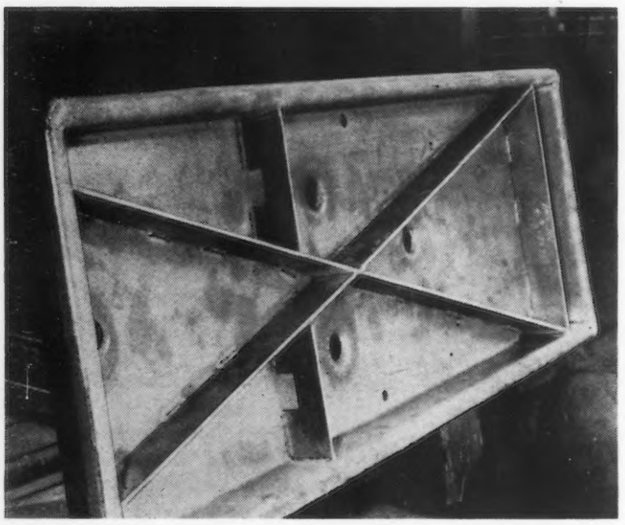


FIG. 2—Bottom view of welded steel drip lip type baseplate, showing the arrangement of reinforcing members. No light job, this base will support a 12 x 10-in. pump and 350-hp., 1760-r.p.m. driving motor.

IN the design of centrifugal pumps, the manufacturer is primarily concerned in developing the minimum number of pumping units which will cover the pressure and capacity requirements of customers, without disturbing a practical balance between the maintenance of high efficiency and a lower cost of manufacturing in larger quantities of the same sizes. As can readily be appreciated, this necessitates the manufacturing of a large number of pumps with each of these pumps requiring various sizes of motors for drive. The size of each complete unit, including pump, coupling and motor, will, therefore, vary considerably in dimensions, thus demanding a wide variation in size and dimensions of the baseplates on which the motor and pump are supported and alined as a unit.

With the advance in the art of welding, the idea of using welded steel baseplates presented a number of advantages, including eliminating the necessity of making, storing and maintaining all of the patterns required for cast iron baseplates. When it is considered that each pump requires several different sizes of motors for drive—inasmuch as it is possible to install impellers of different diameters in each pump in order to cover the maximum pressure and capacity range—and considering the large number of pumps required for a complete line, it is clearly seen that the use of cast iron baseplates requires innumerable patterns or pattern changes for making the baseplate castings. The use of the welded steel eliminates all patterns and allows standardization of baseplates, since a relatively few sizes may be built up for stock without pads to accommodate, for example, a standard line of single-stage, double suction centrifugal pumps up to, say, a 16-in. size.

On any particular order the required pads to fit under the motor and pump are welded to the baseplate. Use of welded-on pads gives a flexibility in design that is accomplished at very little expense since no pattern changes are required—the only extra cost item being a pad location drawing, which ordinarily can be made up in a few minutes. Many of the accompanying photographs show various designs of pads, both low and high, the latter for the high temperature boiler feed pumps, where the feet on the pump casing are located up near the centerline.

Fig. 1 shows the standard construction for a low pad mounting and also illustrates the drip lip type baseplate. The complete bed length is made of one plate which is bent on a special bending machine, forming a drain trough or drip lip along the two lengthwise edges. At each end of this plate, narrow sections of bent plate are welded to form the trough ends of the baseplate

and the corners are completed by welding in bent quadrant sections formed in a stamping press. This method of manufacture is convenient and inexpensive from the tooling angle inasmuch as the drip-lip sections on all baseplates of a line are identical in size and shape. The drain hole for the trough is made by welding on a pipe thimble with a wire screen disk included.

This drain trough adds greatly to the rigidity of the base, and the customer is usually advised to retain it for this reason, even though the trough be later filled with cement when the base is being grouted in place.

Primarily, however, rigidity is obtained by welding in cross members and other reinforcing webs on the underside of the baseplate as in Fig. 2. Several possible arrangements are shown in the photographs, some dictated by the pump design as in the case of the large baseplate, Figs. 3 and 4, which has a pocket to give the necessary clearance for the long return passages on the pump—a multi-stage type.

The addition of extra cross members are necessary to accommodate extra large heavy motors like the 700-hp. motor shown in Fig. 5, driving a five-stage boiler feed pump. This photo also illustrates an unusually long base made up of two plates of different width welded together, since the extra width is required only at the motor end.

Welded steel baseplates being made of higher strength material than cast iron allow the use of thinner sections than could ordinarily be supplied in an iron casting. This reduction in thickness reduces the weight of the baseplate and permits an appreciable saving in overall weight on some of the larger units such as circulating pumps, series units, geared unit and boiler feed pumps. This weight saving is particularly advantageous for marine installations. In any case, the units are more easily handled and the saving in freight is frequently an appreciable item. Increased rigidity directly benefits the user, in affording greater ease in alining and grouting-in of the pumping unit since the baseplate has less chance of becoming warped or sprung during shipment.

Another distinct advantage is that these steel bases take a very nice paint finish and make a neat looking unit without the aid of any special filler, which is more susceptible to chipping or marring.

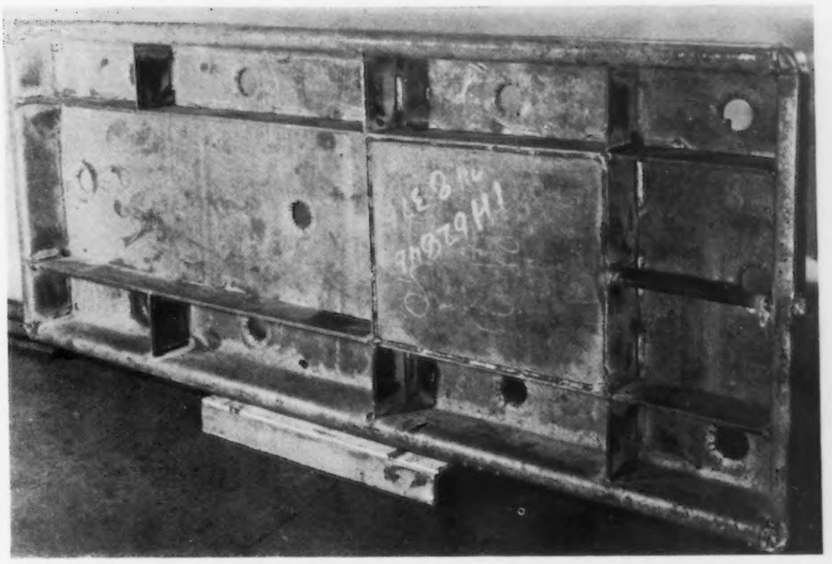


FIG. 3—Special features of a multi-stage pump necessitated this type of construction wherein a pocket is formed under the pump body.

These baseplates are given a covering of paint on the underside to aid materially in resisting corrosion. Besides, the use of a copper bearing, corrosion resistant steel plate tends to make these baseplates durable even under bad operating conditions, although obviously such bases will not stand the attack of acids, chemicals and caustic solutions.

Because of the advantages enumerated above for this type of construction, it is with increasing frequency that pump users are specifying the use of welded steel baseplates.

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FIG. 4 — Top view of the base shown in Fig. 3, showing pocket in base and one form of high pump pad.

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Silver to Replace Nickel a

By ADOLPH BREGMAN
Consulting Engineer, New York

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MANY types of quality goods such as ornaments, table and kitchen equipment, novelties of a thousand types, and containers for food products, could have their salability enhanced by a coat of electroplated silver, if properly advertised and labeled; and perhaps all the more so if the position of silver in the defense program were intelligently presented to the public. Some articles, made to sell cheaply for utilitarian purposes, might deter the prospective buyer if labeled "Silver Plated." The words might frighten the purchaser into looking around for something cheaper, but such cases could be overcome by having the reasonable price displayed in close proximity to the word "Silver Plated" to prevent any false impression.

Possibly it will be in the field of articles used with food, beverages, drugs, or cosmetics that silver will have its best chance. This would include containers provided by the manufacturers of the commodity, which may be returnable or non-returnable, and articles with which the commodity would be used, such as kitchen spoons, trays, apple corers, graters, the parts of electric mixing devices, cocktail shakers, bathroom fixtures, dressing table gadgets, and the like. Articles that come in contact with the hands, such as scissors, automatic pencils, desk devices, keys and keyrings, manicure tools, doorknobs might also be more salable if silver plated.

Much attention has been paid to attractive packaging during the last few years. Changes made have been described as a revolution in marketing. Thus, cheese was once cut off the big drum shaped head and wrapped in a bit of brown paper. The next step was to sell it ready-packaged in tinfoil and cardboard, and more recently it has been dispensed in handsome glass containers, so handsome that many a sale has been made as much by the container as by its contents and housewives make collections of the patterns that please them. Silver plated containers, such as beakers or pitchers for food products, jars or cups for cosmetics and attractive boxes for household drugs, might well attain the same popularity, especially if the public were taught to "look for the silver lining."

Silver tarnishes when exposed to certain elements, but when used and washed as is done with dishes or other articles in regular use, it keeps its bright, clean appearance for a surprisingly long time. Housewives still prefer it for tableware in spite of all the well advertised virtues of stainless steel and chromium plated ware. Surfaces that are not exposed, such as the lining of a food container, do not tarnish, and outside surfaces can be protected with a coat of clear lacquer.

The usefulness of metal articles, aside from their appearance, will in many instances be improved by silver plating. The coating will simultaneously protect the basis metal against corrosion, secure the contents from contamination or discoloring and give adequate life (resistance to corrosion plus erosion). With returnable or non-returnable containers for the handling of foods, drugs, beverages, chemicals, cosmetics or the raw materials for their manufacture, the specific

FIG. 5—The decorative value of many types of packaging articles can be enhanced by silver plating, as illustrated below. These bottles were coated by chemical reduction process, the bottle lining being about 0.00001 in. thick. Photo courtesy of the American Silver Producers' Research Project.



el and Chrome Plate . . .

In this second and last article on the use of silver to replace nickel and chromium in plating, the author covers the salability of silver plated articles, their utility, design and manufacture.

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germicidal and chemical character of silver may be a genuine advantage, one that might even encourage the manufacturer to continue its use when the metal market has returned to comparative normalcy. This aspect is of special importance with refillable or returnable containers, whose initial cost is not a prime consideration, but whose permanence and chemical resistance are.

Design and Manufacture

Will silver plating entail any difference in the manufacture of the basic metallic article? According to Addicks and Dornblatt, the problem of design requires an approach different from the conventional tendency to take any fabricated article and then merely try to coat it with silver. However, it is not felt that problems will arise which cannot be successfully solved by the application of simple and established principles.

Several facts have been established which should be given consideration by the manufacturer, concerning the best kind of basis metal for the purpose, the best methods of fabrication, soldering, annealing, and the like, as well as the most economical and satisfactory technique of the actual plating. One of their principal problems was to determine the minimum thickness of silver that would be required to provide a pore-free coating on various types of basis metal. Also it was necessary to find tests by means of which the relative porosity of the deposit may be established. It was shown that the porosity of a silver electrodeposit on steel is dependent upon three factors: (1) The thickness of the coating, (2) the smoothness of the base metal, and (3) the actual technique of electroplating.

Tests are available to determine the porosity, and therefore the quality, of the silver plate. In one test, suitable for the very thin deposits, the sample is degreased, then heated in distilled water in an open glass dish just below boiling, 194 to 203 deg. F. for 3 hr., then allowed to stay in the water as it cools for at least 18 hr. longer. If rust spots develop, they are easily visible, and each spot indicates a pore in the plate.

The manufacturer of the metal container or novelty must therefore give first attention to the quality of his basis metal. The smoother it is, the better its finish and the less silver will be needed to prevent corrosion and maintain appearance and usefulness. Deep drawing steel of " good commercial" grade can be electroplated, upon a copper undercoat, with a pore-free silver coating only 0.0001 in. thick. Further deep drawing steel of "commercial" grade, with a suitable undercoat, if electroplated to give a pore-free silver coating 0.001 in. thick, can then be subjected to drastic forming and heating operations without damage to the coating. With scrupulous care in plating, using a basis metal of very smooth surface, free from pits, scale, scratches, etc., and a polished copper undercoat, a silver coating as thin as 0.00001 in., free from porosity might be obtained.

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FIG. 6—This drum is silver coated by electroplating—approximately 0.001 in. thick—for protection.

Photo courtesy of the American Silver Producers' Research Project.



One practical question is this: Should the silver plate be applied before or after the major forming operations? This will depend upon individual requirements, but the conclusions and observations of the American Silver Producers' Research Project will be helpful to the designer. In the first place, the manufacture of silver plated sheet steel can be carried out at a cost that compares reasonably with that of base-metal coated steels, and objects fabricated from such steel may be joined or assembled with low-temperature silver brazing alloys and induction heating, carried out under ordinary atmospheric conditions.

One possibility here is the plating of seamless cylindrical can bodies, and flat sheets from which the ends may be blanked. When considerations of cost will permit a heavier silver coating, the can may be assembled from parts that are spun or domed, for example, using a rolled lock-seam. Nonreturnable containers, where the main requirement is for a coating

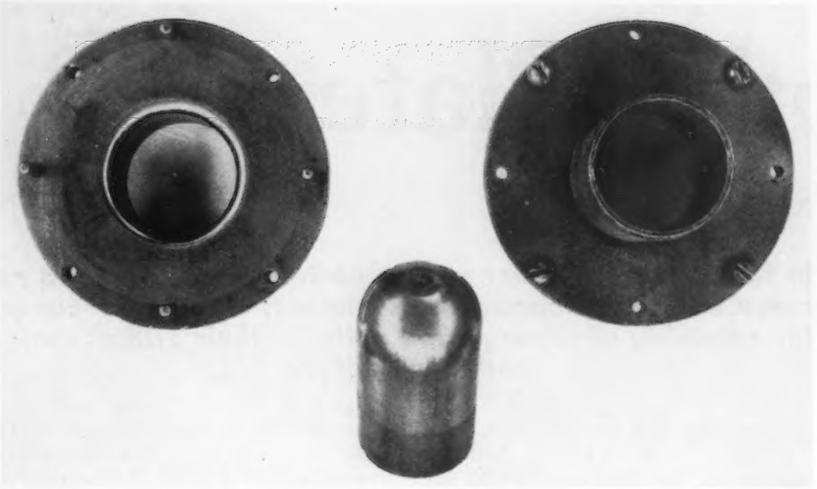


FIG. 7—This is the deep drawing die used in testing the adherence of silver plated sheets. Photo courtesy of the American Silver Producers' Research Project

that will be pore free, might well be shaped up before plating. In general, forming after plating, when the deposit is extremely thin, should be limited to a lock-seam or beading operation.

Drums or tanks can be silver lined by plating the cylindrical sheet before attaching the ends, and plating the ends before assembly, and the lock-seaming operation will not injure the plate. Suitable stop-offs on non-conducting jigs can be employed to prevent the unwanted deposition of silver on the outside of the drum cylinder.

The formability of the plated sheets was studied by several test methods. Test pieces made of different kinds of steel, silver plated by a variety of techniques, and bearing silver deposits of a wide range of thicknesses, were subjected to operations that might be duplicated in commercial production. Thus, disks measuring 2⅜ in. in diameter were pressed into the shape of a cup approximately 1½ in. across and 1½ in. deep; the tools employed are shown in Fig. 7. This test was to determine whether cups of the different test materials, so shaped up, could be produced without any cracking of the steel or of the coating, and without any loss of adhesion between basis metal and coating.

In other tests, circles of plated material 23 or 30 in. across were cold formed into shells such as those in Fig. 8. These were first shaped into a simple cup by a single operation, then the side wall was expanded and tapered, finally trimmed and perforated. The forming was held to be satisfactory if plated circles performed as well as unplated ones under like conditions. Peeling or non-adherence of the coating, if any, is apparent when the edges are trimmed.

The containers shown in Fig. 9 are of interest, especially the tall one with the cone top, which was formed by a severe deep-drawing operation. These shapes are such as might be useful for beverages, milk products and other foodstuffs, or cosmetics, and are susceptible of decoration if desired.

Other tests consisted of rolling silver plated sheets, and if no separation of the coating could be observed after repeated passes, the coating was considered satisfactory. Sheets of silver plated steel of deep drawing quality were spun into saucers, goblets, and the like and examined for evidence of separation.

The effect of heating plated steel in a muffle furnace, in both oxidizing and reducing atmospheres, was also observed, the test pieces being then bent back and forth through an angle of 180 deg. until fractured.

Operations in which low-melting corrosion-resisting silver brazing alloys were employed to join plated steel shapes or fittings, were carried out, and the oxidizing effect, the mechanical strength of the joint, and the integrity of the coating, were observed.

A copper undercoat is recommended, at least 0.001 in. thick. The smoother this coating is, and (within limits) the thicker, the less silver will be needed for a pore-free deposit. When forming operations involving heat are to be performed, the copper undercoat should be separated from the silver plate by a nickel plate, or else the steel should be given a nickel strike, before being placed in the silver bath.

It has been demonstrated that large sheets of deep-drawing steel may be silver plated and subsequently subjected to heavy reduction by cold rolling, to annealing treatments, then to further cold rolling without blistering or other injury to the silver layer.

The technique of the actual silver plating, including the special care needed for the deposit of very thin pore-free plates, is of more direct interest to the plater than to the manufacturer, and will be described in a subsequent article, in which the details of routine will be covered.

Investigations are also being made at this time into the possibility of using silver electrodeposit

FIG. 8—These silver lined half-barrel shells were formed from silver plated steel disks, 23 in. in diameter.

Photo courtesy of the American Silver Producers' Research Project.

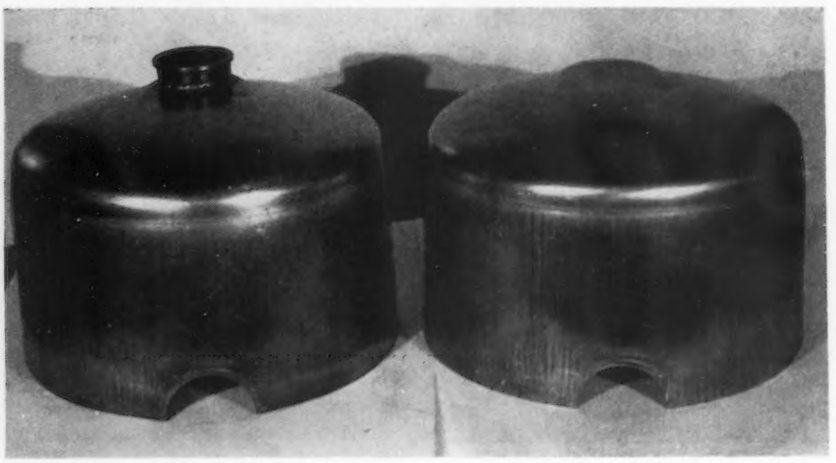




FIG. 9—These silver lined and coated containers demonstrate the utility and decorativeness of silver plating: (1) Ointment box lined with silver, about 0.001 in. thick; (2) can coated by the vaporization process, the plating being about 0.00001 in. thick; (3) beer can prepared from silver-clad copper, about 0.001 in. thick; (4) silver lining of this cosmetic jar, about 0.0001 in. thick, demonstrates the enhancing quality of silver.

Photo courtesy of the American Silver Producers' Research Project.

as an undercoating for chromium plating. The reason for the use of chromium as the finish is, of course, its hardness and wear resistance, together with its non-tarnishing quality.

For this type of work the cost should not be far from that of silver plate and lacquer, differing only by the difference between the chromium plating and the lacquering operations which, although varying with the type of work plated, would generally be small.

To withstand severe service, a thick or heavy deposit of silver may be desired, as in bearings, linings of milk tanks, reaction vessels, industrial equipment exposed to certain foods and chemicals, etc. It has been determined that smooth, dense and adherent deposits of silver measuring 0.05 in. thick can be plated on low carbon steel. Thorough preliminary cleaning or treating is necessary, and the silver plate should be preceded by a copper plate or silver strike.

It has been demonstrated that (1) silver plating of commercial steel can be done at a cost that is comparable with that of base-metal finishing; (2) that very thin pore free silver coatings can be obtained by the use of proper basis metal, proper pre-treatment and careful electroplating technique; and (3) that such deposits can be made either before or after the steel article is fabricated.

In a word it is possible to use silver plate to make up for the lack of nickel and chromium at this time.

Spot Welding Aluminum With Refrigerated Points

POINT life in spot welding aluminum and stainless steel has been materially increased by refrigerating the electrodes to the point where frost is formed on them in spite of the high heat necessary to produce a weld. In resistance welding, heat is generated not only between the two metals being joined but also between the two electrodes and the work pieces as well. The primary function of the refrigeration is to keep the welding points cool at the points of contact with the work so as to offset the tendency of the points to soften and deform and in the case of aluminum welding to prevent pick-up or alloying of the tip with the material being welded.

Peculiarly enough, while the refrigerant absorbs a considerable amount of heat at the tips, experience indicates that welding machine settings are actually lower than when operating with ordinary water cooling. This effect is partly due to the higher conductivity of copper at the lower temperatures. Retention of tip shape by preventing softening is also reflected in the maintenance of higher current density at the weld.

Refrigerating units have been designed for this application by the Progressive Welder Co., Detroit, and are adaptable not only to the Progressive three-phase aluminum and stainless steel welder, but also to other makes of welders. With the Progressive aluminum welder, the reduction in electrode temperature obtained with the cooling unit has so increased point life that 10 min. runs at 100 welds per min. without point dressing are not unusual. Experimental production to date indicates a complete elimination of pick-up when the refrigerating unit is used, particularly on the Progressive units, for which a harder and tougher tip material than is generally available was developed some time ago.

The new refrigerating units are available in a range of three sizes designed for use respectively with single, two and four aluminum welders. The units are provided with automatic thermostatic control, built-in dehydrator, heat exchanger, thermometer, high efficiency pump and safety devices. These self-contained units are coupled to the ordinary cooling water lines of the welder.

. . . More Work from J

A JIG borer operator is paid to turn out precision work rapidly. His machine is designed for fast, accurate production. But when the jig borer must stand idle while the operator sits at a bench doing shop mathematics, the whole system breaks down and much valuable time is lost. Added to this is the probability that even an expert operator will make errors if he has to refigure his drawing dimensions in order to locate them on his machine.

That is why a recommendation is made to engineering draftsmen of a particular method of making drawings for jig borer work. This method will eliminate shop mathematics, because dimensions can be set directly on the jig borer, and no extra calculations are needed. With all figures checked in the drafting room the possibility of mathematical error is greatly reduced, and the operator freed of responsibility. At first glance this method of dimensioning drawings seems reversed to most engineering draftsmen but a little study will prove it correct.

Fig. 1 is a hypothetical illustration of a typical part which might be produced in small quantities on a jig borer, or the same holes might be incorporated as part of a box jig. The dimensions on this drawing are those which will be needed for the jig borer and the subsequent inspection; all the dimensions needed for the pattern maker and preliminary machining purposely are not included.

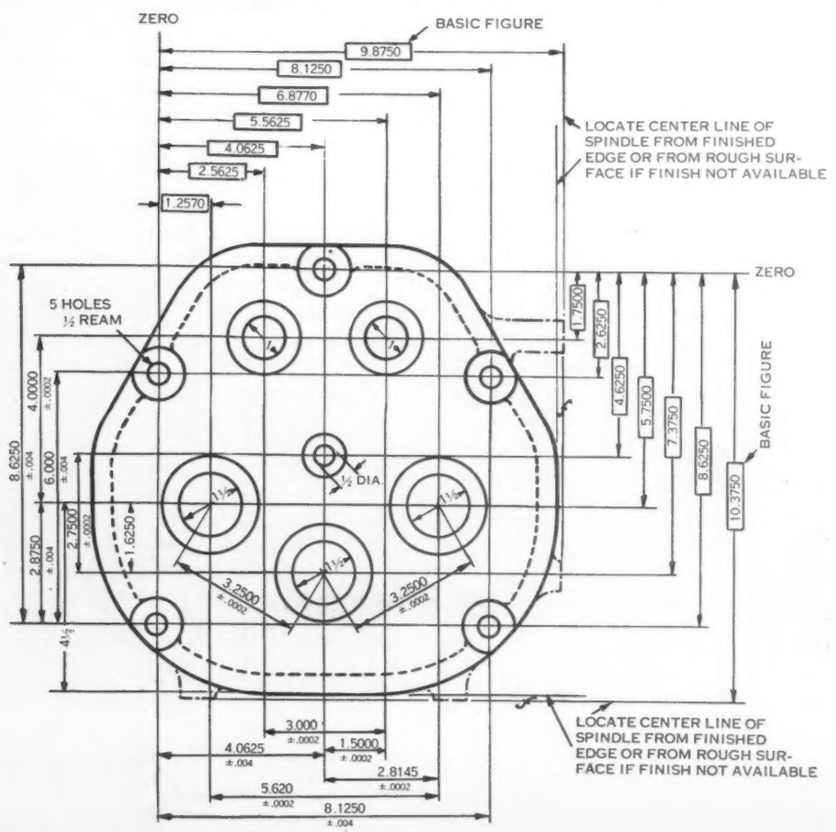
Working lugs have been shown on the right and bottom sides. The piece would be squared up with the front face of the jig borer table using these finished lugs, which might be removed after the piece is finished. Their location can be anywhere that is most convenient, remembering that the operator must use the finished table surfaces for locating. The piece could be located from a rough surface or from any finished edge according to what is desired and available.

The main point is that all dimensions for the holes are located from a zero line at the rear and one at the left.

If the operator is using a Pratt & Whitney jig borer or one of similar type, this system of dimensioning permits him to move from one hole to the next merely by inserting the correct end measures and inside micrometers governing the amount of table movement longitudinally and crosswise corresponding to the coordinates of the drawing exemplified in Fig. 1. The same system of dimensioning and positioning of the work will also apply on machines in which the table is located by lead screws and dials or by vernier scales. The details of setting the machines will vary, of course. In any event, the operator can set directly from the drawing and he does not have to subtract any dimensions. Without any difficulty, he can follow good drilling and boring practice by working on holes on opposite sides of the piece successively. This avoids excessive distortion from heat or from strains in the metal relieved by machining. He can also finish all the rough drilling first and then go back to the same holes to complete the finish reaming or boring operations successively according to the limits involved, as will be explained later.

On the drawing the dimensions enclosed by rectangles are basic figures and do not show tolerances. These are the dimensions the operator uses to set his built-in measuring instruments on the machine. The dimensions not enclosed in rectangles show the required tolerances. They serve the double pur-

FIG. 1—This system of dimensioning a jig borer drawing from two coordinate base lines eliminates any calculations on the part of the machine operator. The dimensions in boxes are basic figures used by the operator to set his instruments. The others show the operator the required accuracy of the various holes and are for the inspector's use. All dimensions should be worked out in the tool engineering department in advance, to eliminate any need for mathematics by the jig borer operator.



Jig Borers

By F. O. HOAGLAND

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PROPER dimensioning of jig borer drawings in the drafting room saves time and eliminates errors in arithmetic on the part of the machine operator. The author also discusses the principles of hole tolerances and their relation to shop methods and the time factor.

pose of aiding the operator to select the proper method of finishing the holes to produce the specified tolerances, and also enable the inspector to check the finished job on a surface plate.

Operating Procedure

With this drawing, the proper procedure for the operator on a jig borer using end measures is as follows:

Set the work on the table with the finished edges at the right and toward the front respectively. Then with an indicator line the piece up with the table traverses in the usual manner. With 9 in. of end measures in the longitudinal trough and the inside micrometer set at 0.875 in. (basic figure for finished edge) move the table until the center of the spindle is directly over the finished edge at the right. Slide the measuring contact against the end measures with enough pressure to move the needle on the dial indicator one-half a revolution. Then fasten the slide clamp. Turn the dial until the needle point is at the zero mark.

Follow the same procedure for the transverse slide, locating the center of the spindle over the finished edge nearest the front of the table. Use 10 in. of end measures and set the inside micrometer to 0.3750 in. (basic figure for finished edge), then move the table until the dial contacts as above and set it to zero. The measuring device is now set for both slides. The measuring stops and dial indicators must not be moved again until the work is finished or relocated.

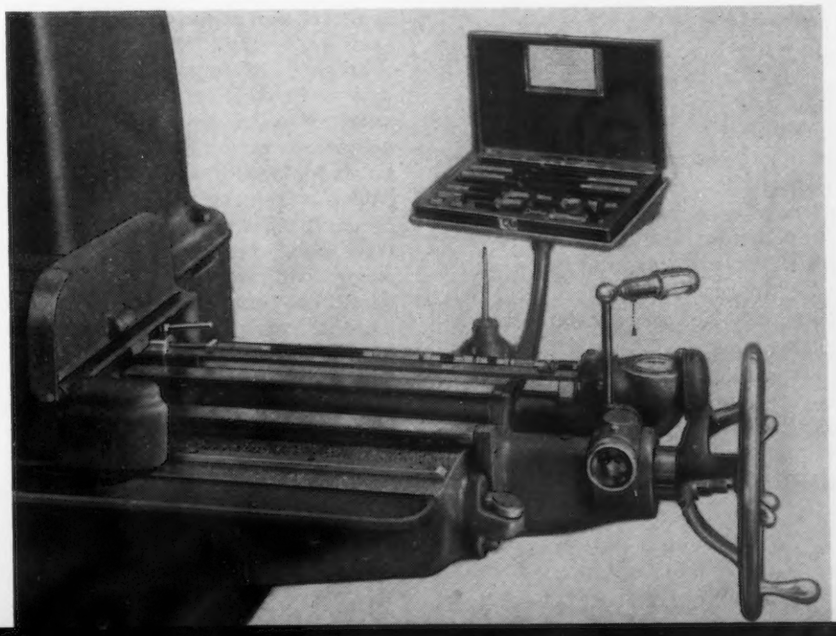
The drawing shows a basic figure of 8.1250 in. longitudinally and 8.6250 in. transversely for the first hole in the lower right corner of the work. Change the even-inch measures and inside micrometer in the respective slides to obtain this reading and move the table to the right and then forward until both dial indicators read zero. This locates the work for the first hole. Bind the table and carriage. Release the pressure of the leadscrews in the nuts, relieving all tortional strains. This must be done to bore accurately, as any sudden jar to the bracket or the machine while the screws are under strain would move the table and immediately show up on the dial indicator.

While the first hole is being bored, change the end measures and reset the inside micrometers for the second hole according to the basic figures on the drawing. By turning the indicator knobs back, pressure on the measuring instruments is released, so that they can be removed without changing the position of the table.

With this type of jig borer, there are two inside micrometers furnished, one for each slide. Care should be taken to use the same micrometer in the same measuring slide each time. This is important. Particular care must be taken if there is a change of operators before a job is completed. (On P&W jig borers, inside micrometers are marked with red and green bands to distinguish them.) The contact surfaces of the end measures, micrometers, etc., should always be wiped clean. Care should be taken to keep both the machine and the equipment clean if best results are to be obtained.

One of the problems frequently encountered in jig borer work is the location and boring of holes equi-spaced on the circumference of a circle. The easiest way to do

FIG. 2—Below is shown one of the two jig borer slides, with the end measuring instruments in place and the "zero point" established. The end measures are for even inches and the inside micrometer for thousandths (0.001 in.). The dial indicator is used only as a pressure gage to maintain the "zero point".



this job is to equip a jig borer with an auxiliary rotary table, and to dimension the part with polar coordinates. The calculations involved are quite tedious, but have been greatly simplified by the recent publication of voluminous tables. If a rotary table is not available, then rectangular coordinates must be used.

Accuracy of Boring

The problem of fine precision boring is a threefold one. In the first place, the spindle must run absolutely true. On the part of the machine builder, this is a question of specifying super-precision ball bearings and subjecting them to a rigid inspection under a preload when they are received in the plant. Secondly, this spindle must be located by the operator of the machine exactly over the spot where the hole is desired. Finally, the hole must be finished in that exact location. The second is a spacing problem, the third a boring problem. Location of the hole has already been discussed. Its accuracy depends upon the measuring system used. The system of end measures is accurate to ten-thousandths and will stay so indefinitely, regardless of wear in the screws.

Precision boring, on the other hand, is a question of tolerance and nothing else. If the job must be held to a quarter-thousandth, the problem is an entirely different one from the job where the tolerance is a thousandth or more. Except for small holes, the only way to produce quarter-thousandth accuracy consistently is by using a single point boring tool for the final operation. It is necessary first to spot the hole accurately, rough drill it undersize, and then finish to size with as many passes of a single point tool as are required for diameter and finish. This is the most accurate but also the slowest method. However, this method is many times faster with a jig borer than with other machines.

This is the only method which will absolutely guarantee a truly positioned and a truly round hole with an accuracy of a quarter-thousandth. It is possible with extreme care to better that accuracy if occasion demands. There are other ways of finishing holes which will approach this accuracy, but they are not as consistently accurate.

Beginning with this single point boring method as a basis for finest accuracy, the time of finishing decreases as the amount of the tolerance increases, until it is possible to finish holes in a few minutes apiece when a thousandth or two is close enough.

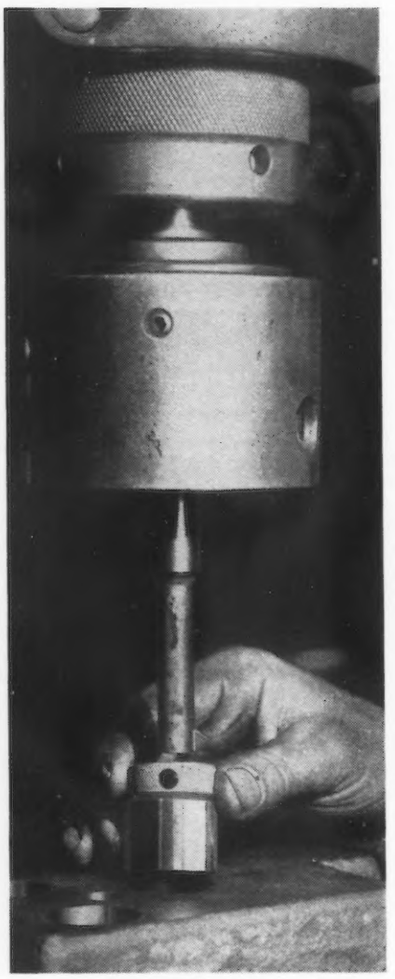


FIG. 3—Stub gages are handy to check hole sizes in jig borer work. Often you can get in with one of these short gages where a regular plug would force you to shift either the table or the spindle. The hole in the top is for a pin to prevent dropping the gage into an oversize hole.

When the allowable tolerance is between 0.005 in. and 0.001 in., for example, the following method is satisfactory. First spot the hole with an accurate V spotting tool and rough drill it undersize. Then an undersized end mill (sometimes called a reamer drill) should be used. In effect the latter is a multiple point boring tool with sufficient stiffness and cutting ability to correct some of the drill errors. Then when an on-size reamer is used to finish the hole, the reamer will have a truer hole to follow. This method is much faster than the single point tool, and is highly satisfactory for the limits stated, particularly for deep holes.

It is possible to modify the previous method by using a series of end mills of increasing diameters, and obtaining the final size with a reamer. Each succeeding end mill operation rectifies the hole a little. The final accuracy obtained by this method is comparable to the single point tool. It usually takes fully as long, however, as the latter method.

As an alternate to the use of the end mill, it is possible to chamfer the edge of the hole instead, tending to start a reamer correctly. With this method, a graduated set of reamers instead of graduated end mills are used. It is possible also to use a single point tool for a short distance and then finish with a reamer.

When tolerances of several thousandths are permissible, the following method is by far the fastest. The hole is spotted, using a rigid V spotting tool, it is rough drilled undersize, and put through a reamer of the finished diameter desired. The reamer will follow the drilled hole, but if the latter has been spotted correctly, the drill size is correct and the drill sharp, the error usually will be within a tolerance of 0.002 in. This method should not require more than an average of a few minutes per hole. By using an end mill reamer the tendency to follow the drilled hole is practically eliminated.

Boring Small Holes

When holes are very small or very long or both, and require fine accuracy, it may be impossible to use a single point tool. In that case the best method is the one of chamfering and graduated reaming operations, repeated until the desired size is reached. The very small reamers used are made from hardened tool steel wire. These reamers are not fluted but have three cutting edges ground in the form of a diamond on the end. They will not carry a cut of more than 0.002 in., but are very satisfactory for small holes.

It should always be remembered that the roughing operation creates more or less heat in the work piece. Time should be allowed for cooling to normal room temperature before any finished operations are begun. Neglect of this important point is a frequent cause of precision boring errors. Cooling can always be hastened by stacking pieces of cold metal on the work.

Speeding Machine Tool Production

A skid-lift-truck system at Kearney & Trecker's expanded plant maintains flow of small parts for Milwaukee millers through process, stock and assembly

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ALTHOUGH machine tools are the foundation of modern mass production, they themselves have rarely in the past enjoyed the benefits of mass production. But they are beginning to now.

Especially is this true in the modern plant of Kearney & Trecker Corp., partly because of the overwhelming demand for machine tools created by the American defense program and partly because the plant is devoted exclusively to the manufacture of milling machines.

Growth in the company's payroll affords a good indication of the plant's present high rate of production. During the former peak year, 1929, employees numbered 904. This peak was topped in 1939 with 1352 employees, but the year 1941 finds their number more than doubled at 3206.

One factor responsible for increased production is a thoroughly modern plant laid out for "straight-line" assembly. Another is a 24-hr.-a-day working schedule. A third is a smooth-working handling system in which a fleet of battery industrial trucks serve the production of more than 3000 small parts, including 2000 different gears, as well as their delivery to the main production and assembly line.

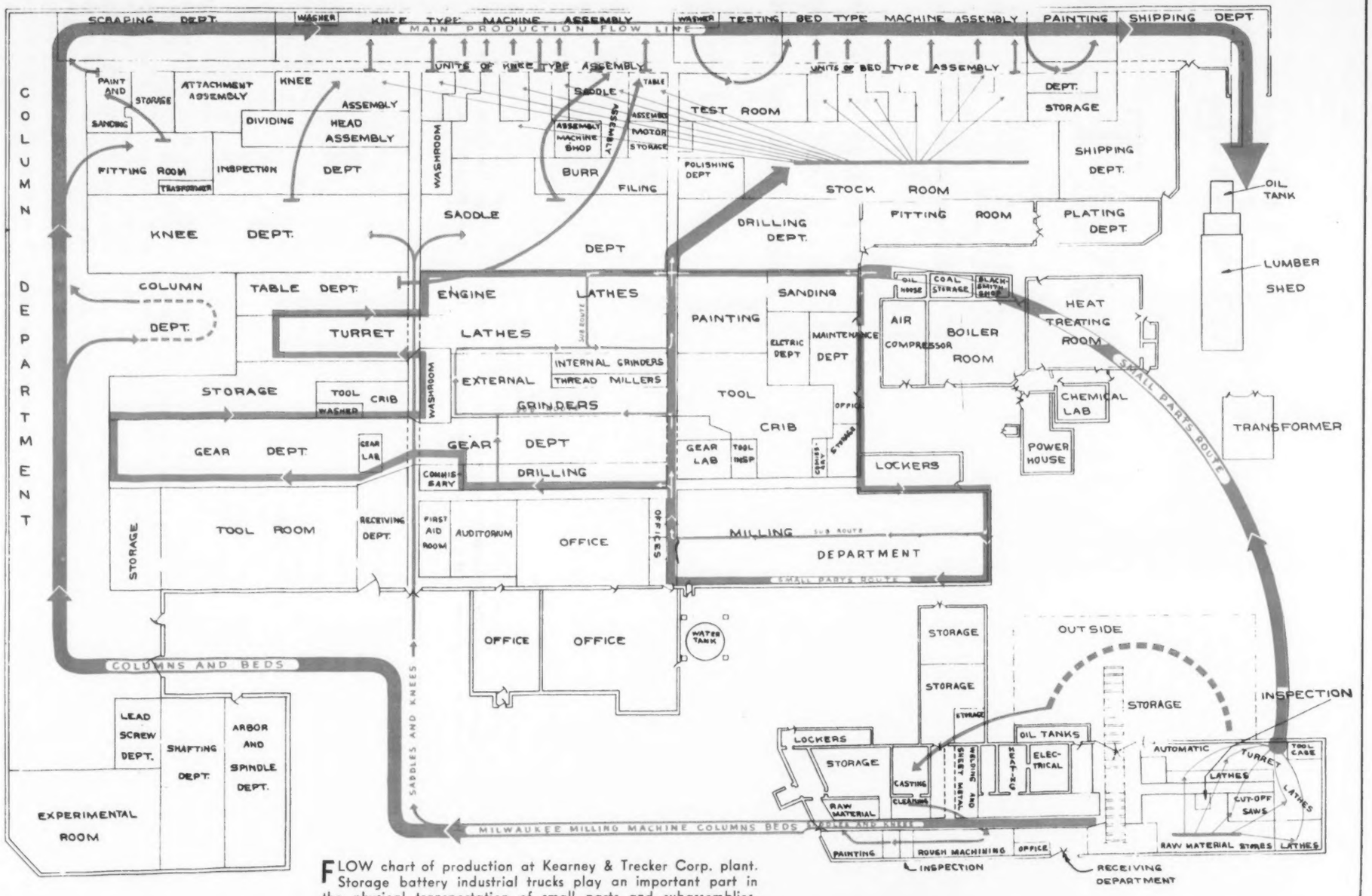
The general plan of these lines of production is shown on the accompanying diagram where the main line of production flow represents the columns, beds, saddles and knees which comprise the main structures of a milling machine, and the small-parts routes, as the name implies, represent the parts including gears.

The main line of production flow is served by overhead traveling cranes and consists of a step-by-step progression through various machining operations to assembly; it is here, as the diagram shows, that the small-parts routes converge upon it.

These parts, consisting originally of forgings and castings, are put on skid platforms, boxes or racks immediately upon their receipt, and are handled by battery industrial truck in the same types of unit loads during the entire journey through milling, grinding and other finishing operations, to inspection, stock and finally to assembly.

During the various finishing operations, the work is taken from one skid load and deposited in another as the operation is completed. In all departments, aisles are plainly marked by yellow boundary lines painted on the floor, while for the most part, machines are arranged with the operator's position on the side facing the aisle. They are spaced to allow room for at least two skid units placed at the operator's right and left, both to minimize handling by the machine operator and to facilitate delivery and pick up of loads from the aisle.

Skid racks are employed for gears, skid boxes for relatively small parts such as levers, pulley wheels, pins and small shafts; and skid platforms for relatively large parts, such as knees, saddles, columns and the like. To pick up the larger parts, set them up in the machine and lower to the outgoing skid platform, overhead equipment is employed. The small light parts are, of course, set up by hand. The



FLOW chart of production at Kearney & Trecker Corp. plant. Storage battery industrial trucks play an important part in the physical transportation of small parts and subassemblies.

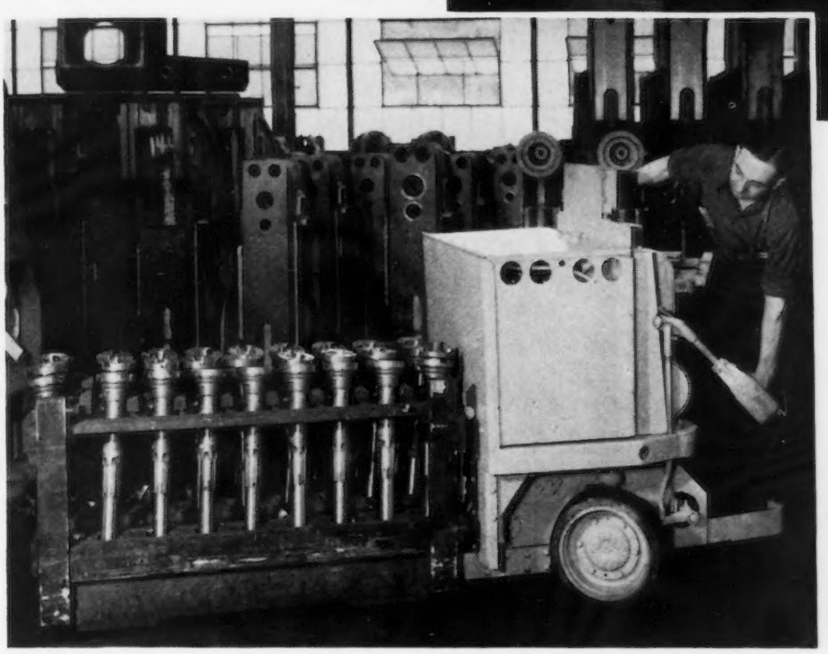
same is true at final assembly.

Although only one stock room for finished parts is indicated in the diagram, there are numerous temporary storage points for rough and semi-finished parts in virtually every department. These consist merely of skid units beside the aisles, tiered two or three high as necessary to equalize variations in the rates of successive operations.

As may be readily appreciated, the very large variety of finished parts that must be kept constantly available for assembly demands



THIS aisleway shows the systematic manner in which skid containers are employed for work both in process and in temporary storage.



SPECIAL skid racks are used for transporting component parts like spindles, spline shafts and gears, which would be damaged if thrown into an ordinary skid container.

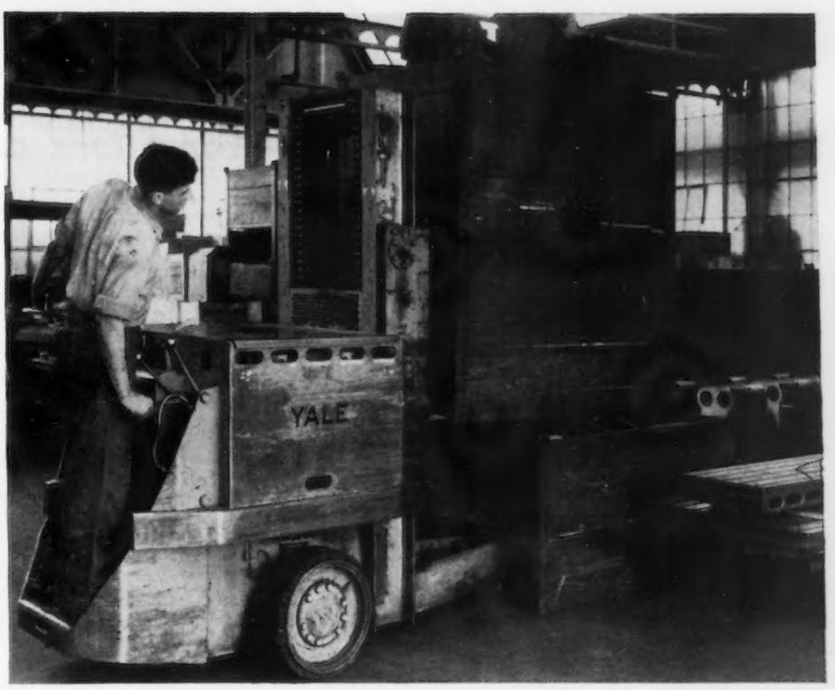
careful management of their individual production lines if bottlenecks are to be consistently avoided. As usual, in such cases, the general plan followed is to arrange the various operations of a series, so far as possible, so that the rate of each one equals or slightly exceeds the rate of the next.

The skid-lift-truck system, by its high flexibility, aids greatly in accomplishing this result, while the tiering of loads at these points of temporary intermediate storage plays an important part in obtaining maximum production from the available plant facilities. This was provided for last year by the addition of a high-lift truck to the company's existing fleet of low-lift trucks.

Although the call system of the plant can be used to summon trucks where needed, this is rarely necessary. The trucks operate constantly along their established routes, passing each point every few minutes throughout the 24-hr. day.

Despite the number and variety

MATERIALS in skid containers are tiered for temporary storage at numerous points throughout the plant.



of parts handled, the company has found it possible to standardize on two principal sizes of skid units: 34 x 60 in. and 28 x 40 in. The skid boxes employed are of steel construction designed for tiering. Trucks range in capacity up to 4000 lb.

Floors enjoy the best maintenance which permits use of delicate ampere-hour meters not ordinarily found on industrial trucks. Batteries range from 24 C5s to 24 68s and operate the trucks an average of 10 to 16 hr. per charge. Trucks are taken to the electrical department and batteries exchanged either according to the discharge indication of the meter or when completion of charge of other batteries makes charging facilities available. Like the plant itself, the charging equipment works 24 hr. a day and its full capacity is almost constantly required.

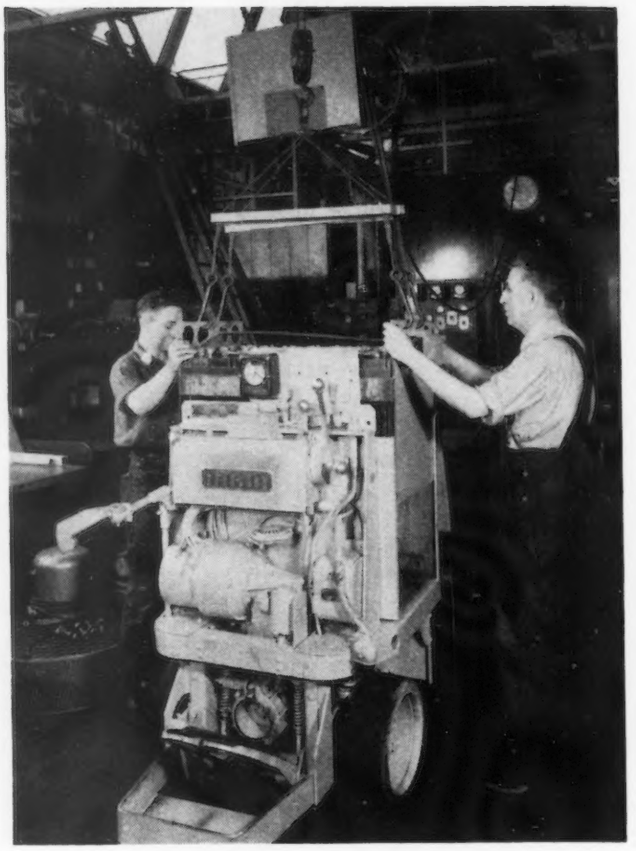
The trucks, including batteries, are making a record of close to 100 per cent availability for duty despite the 24-hr. working schedules which have now prevailed for nearly two years.

Hand-lift trucks are also employed in nearly all departments for convenience in shifting skid loads short distances when power trucks are not immediately at hand, but all of the actual flow of small parts between departments plus most of it between operations are maintained by battery lift trucks.

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LIKE the plant itself, the battery charging equipment works 24 hr. a day. Batteries are shown being exchanged by means of an electric hoist and special handling rig.

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Effect of Drawing Conditions on Steel Wire

THE effect of such factors as drawing speed, die entrance angle, and lubricant on the drawing efficiency of wire of three types of steel, containing 0.06, 0.40 and 0.60 per cent carbon are reviewed by F. Schwier in *Stahl und Eisen*, June 12. Following a review of current literature and observations from investigations, the author arrived at the following conclusions:

(1) Drawing efficiency was increased because of the reduction in power required as drawing speeds were increased.

(2) The strength of a wire drawn at 5¼ ft. per sec. was greater than that of wire drawn at 1¼ ft. per sec.

(3) The drawing efficiency increases with increased reduction in the section.

(4) The best die entrance angle was 10 deg., but the drawing efficiency increased more slowly with large reductions in area as the entrance angle was increased.

(5) Wire with the most uniform properties were drawn with the greatest drawing efficiency.

(6) Greater drawing efficiency was obtained with hard die materials.

(7) Drawing wire through a harder die did not affect the wire properties.

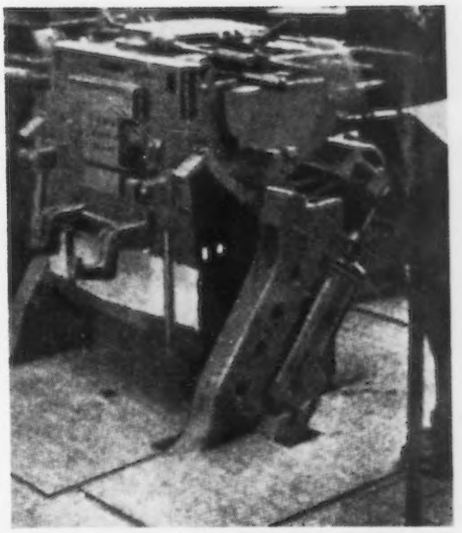
(8) Pulverized soap was found to be the best die lubricant and engine oil the worst.

(9) Increased die entrance angle permitted the best drawing efficiency when inferior lubricants were used.

(10) Tests made at temperatures between room temperature and 266 deg. F. showed that less power was required with increasing temperatures and the reduction in power was greater with increasing reduction in area. However, above 212 deg. F. there was no further decrease in the deformation efficiency.

(11) Wire strength increased with increasing drawing temperatures, especially with high carbon steels, while elongation decreased.

Die-Casting Aluminum Aircraft Cylinder Heads



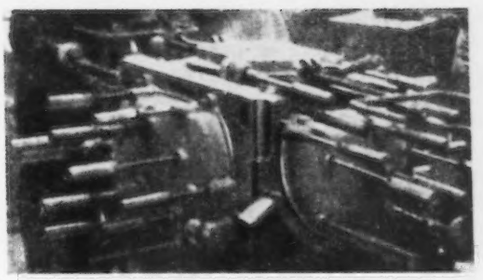


FIG. 2—Vacuum die-casting machine used by Bruneau Frères, Paris. The entire die assembly is mounted in a frame and is tilted as pouring is started, then slowly returned to the vertical as pouring progresses.

THE use of die casting methods for producing aluminum aircraft engine cylinder heads results in a production increase of fully 50 per cent over sand casting methods, according to a recent article published in *Aircraft Engineering*, London. In addition, die casting causes less waste, gives better grain and better surface, it was stated.

Considerable work has been done in France on the die-casting of such pieces and some details of a French die casting machine were given in the article.

The French machine (see Fig. 1) employs a composite die consisting of a number of plates or laminae, with the fin profile recessed in each face so that the edge of the fin is at the junction line of two consecutive plates. The mold is thus subdivided into layers corresponding to the number of fins on the cylinder head. The individual plates must fit very accurately, and are therefore highly polished. As they must be entirely free from warping or scaling at high temperature, they are made of a heat-resistant alloy with about 5 per cent chromium and 3 to 5 per cent tungsten.

Since the natural escape of air through the joints of the mold would be insufficient, in the case of deep and thin fins, to insure the metal percolating to the tip, the so-called Bruneau die differs from the standard Gnome-Rhône type by applying artificial suction.

At the instant of pouring, the air is sucked out of the fin through the joints between the plates, thus enabling the molten metal to fill the fin space completely. Moreover, the amount of suction applied varies for different zones of the cylinder head, the value being determined by experience.

The entire die assembly (Fig. 2) is mounted in a frame which can be tilted, and heated from below by a number of gas jets. When pouring begins, the die is inclined, and gradually raised to the upright position as pouring proceeds.

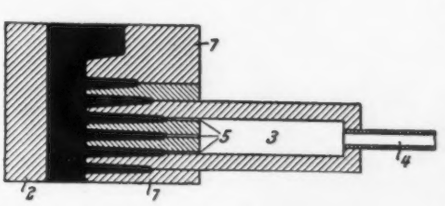


FIG. 1—Details of a French die-casting machine for aircraft engine cylinder heads, showing method of exhausting air in mold. 1 = die; 2 = core; 3 = suction; 4 = connection to vacuum chamber; 5 = air passages.

In Germany, according to the article, die casting is being tried in a number of foundries and may soon be expected to displace sand casting.

Ed. Note: American aircraft engines use sand cast heads exclusively (see THE IRON AGE, Jan. 23, p. 37), but it is understood that considerable research is being carried on in an effort to develop a satisfactory die casting method. Cylinder heads used by the French are still, however, largely sand cast, while all heads used in German aircraft are at the moment sand cast. Many English heads are machined from forgings.

Stampings Replace C

ALWAYS alert for opportunities to gain economies in production, Chevrolet engineers and production men have been successful in converting certain parts formerly produced by forging into heavy stampings of substantially identical dimensions. This has been done, in the cases herein described, not only because production of stampings is more rapid than that of forgings but because much machine work is saved and that which is required can be done more rapidly. In addition, as the work is done cold, there is no use of furnaces or fuel for the production of the stampings.

One of the parts converted from a forging to a stamping is the pitman arm tie rod plate shown in Fig. 1. Its shape and dimensions are approximately the same as for the forging it replaces except that the piece is not thinned at the bend as was the case with the forging. The latter was produced from SAE 1025 steel and the stamping is from SAE 1010 hot rolled steel supplied in strips 9/16 in. thick and 6¾ in. wide. Strips are about 6 ft. in length, weigh 93 lb. and make 48 blanks each.

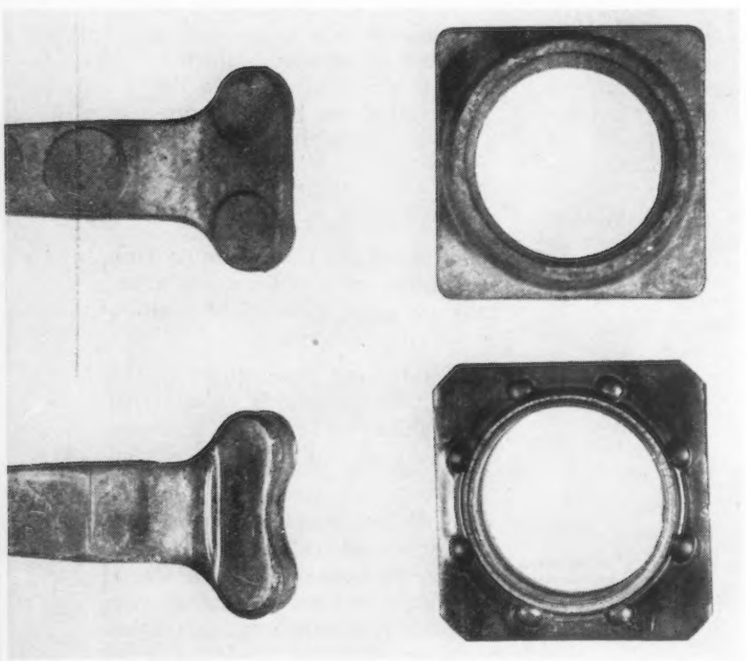
Production starts with blanking in an inclined press, using dies which make two blanks per stroke and turn out 500 blanks per hr. The strip stock is fed by a hand lever and, because of its weight, is supported on large steel balls, each in a socket and designed, of course, to make the feed easier than if the stock merely rested in an angle-shape feed rack. Pieces are staggered in the strip, to conserve metal, and they drop through the die and the bed of the press onto a plate conveyor which carries them to the adjacent forming press.

The forming required is not severe and is done cold, one piece at a time, using hand feed and hand ejection. After forming, pieces are dropped into an inclined chute which carries them to the next press. There two holes are punched half way through in the wide end, using tapered punches which flow the metal to help form bosses on the lower face. The bosses are completed in the following operation and are, when finished, 0.190 in. thick. They are made to increase the depth of the hole and afford a longer tapered bearing for bolts which subsequently fit in them.

Finishing of the holes is done in a two-station die in the next press. There, the first operation is to punch the hole nearly through, leaving only flash in the holes, at the same time, completing the extrusion of the bosses. In the second station, the holes are cleared of flash by punching. These two operations are performed on 400 pieces per hr., feed and ejection being done by hand and the finished pieces being dropped into a chute which carries them to the next press. There, the two holes in the narrow arm are punched. Thickness is brought within required limits and bevels are added, as shown on the drawing, by subsequent cold coining operations which also result in smoother surfaces.

Production by the foregoing stamping process makes it unnecessary to drill any holes, as was necessary on a forging since the only operation in which machining (other than the stamping and coining operations) is required is that for reaming the holes.

Another part converted from a forging to a stamping is the axle housing flange assembly, called an "assembly" because it is made in two parts joined by projection welding rather than as a single-piece forging. As shown in the drawing, Fig. 2, the flange is square, except for the corners which are cut off, and has a hub boss at the center and on each side of the welded joint. It is this hub arrangement which makes it necessary to produce the part in two pieces, each of which is stamped from strip stock. Both stampings are relative-



TWO parts referred to in the text as they appear in original forged form (at top) and in present stamped form (at bottom).

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PITMAN arm stamping as it appears in successive stages from blank to finished piece.



Chevrolet Forgings

By HERBERT CHASE

ly simple and both are made in progressive dies, one from 5/32-in. stock and the other from ¼-in. stock. The latter is furnished in strips and the thinner stock in coils. In both cases the stock is 5 in. wide.

Production of the heavier stamping is at the rate of 500 pieces per hr. The die used has five stations but one is vacant. In the first station the hole is pierced and in the second it is enlarged by drifting to form the hub. In the die for the heavier piece, the third station is vacant, but in the fourth station eight dimples are thrown up around the hub and in the final station the piece is cut off. In the thinner piece, the dimples are not required but, instead eight projections are thrown out for the subsequent welding. This stamping is made at the rate of about 40 per min. Welding is done in a special machine equipped with dies which hold the pair of parts in correct relative position and press them firmly together to effect the projection welds. The welding rate is 275 parts per hr.

Assemblies produced in this manner are the equivalent of forgings but are made more rapidly and require much less machining. In fact, the only machining needed is to face off the dimples in the heavier piece, so as to form a boss to center and provide a true face for the brake anchor plate, and to ream and burnish the hole into which the tubular portion of the axle fits and to which the part is subsequently welded.

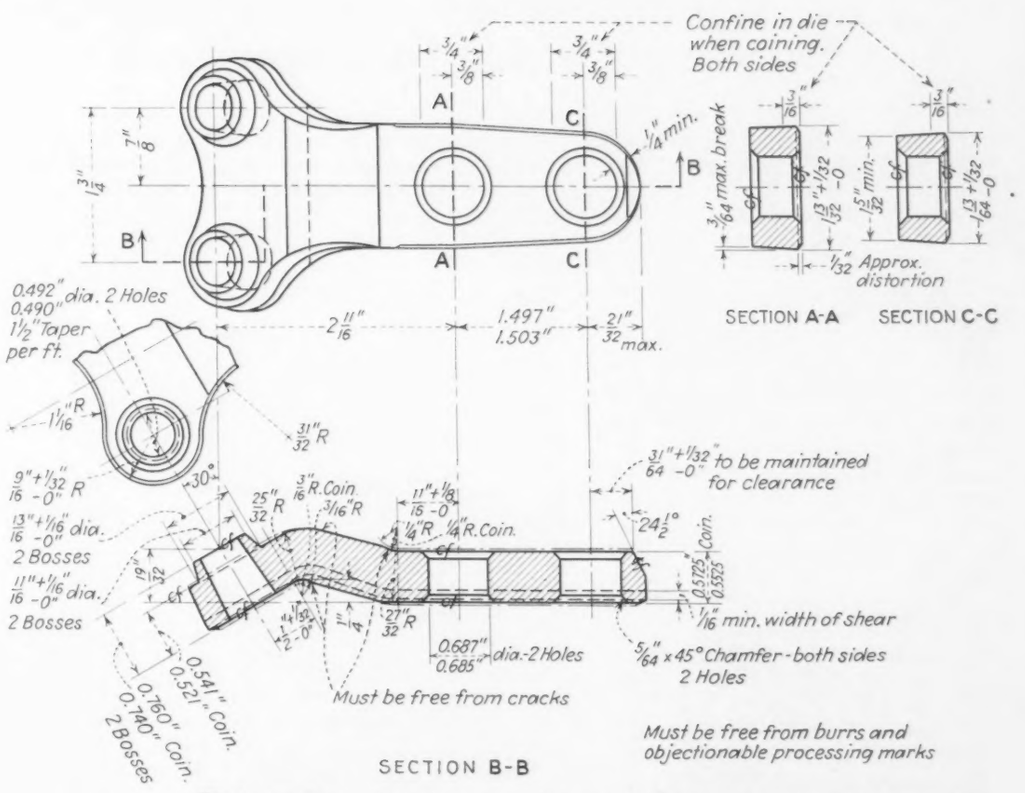
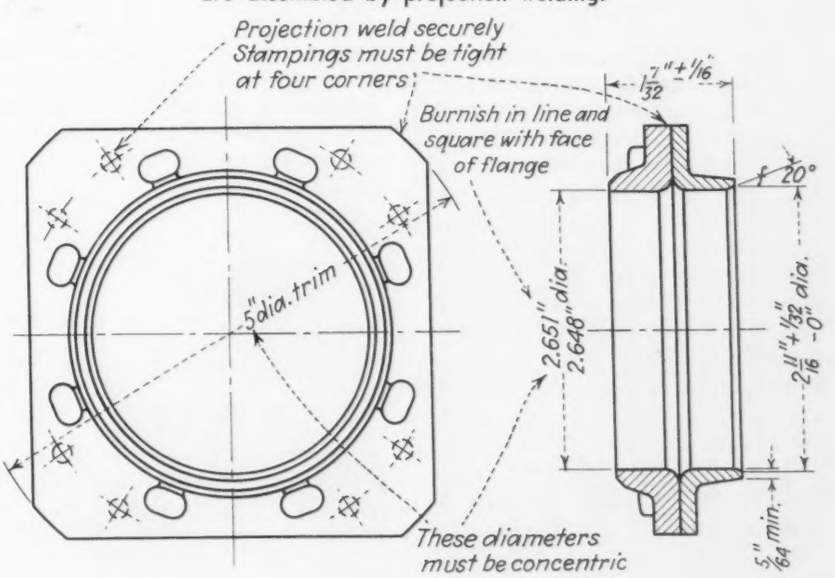


FIG. 1—Chevrolet pitman arm tie rod plate as now produced by stamping. This part was formerly forged in an almost identical shape.

FIG. 2—Assembly of flange for axle. The two parts are stampings and are assembled by projection welding.



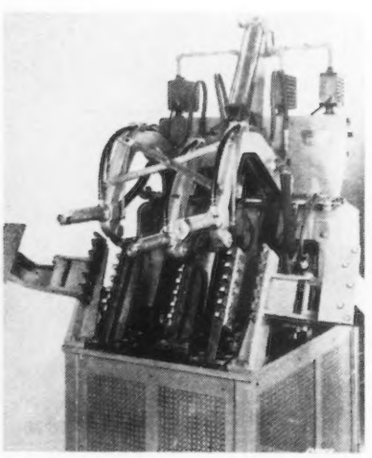
New Equipment . . .

Welding Equipment Tools

This wide range of new developments in welding and accessory equipment, brazing and flame cutting tools may show you, as a manufacturer, how you can cut your operating costs or increase your production.

Automatic Welding Guns

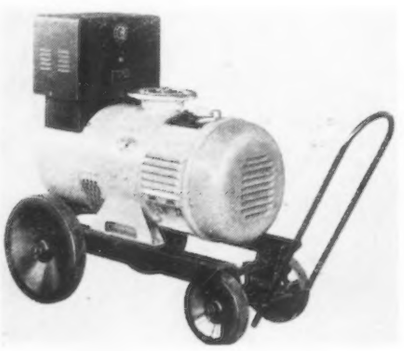
WELDING guns that automatically locate themselves for spot-weld assembling of units built up of a number of parts are features of a welding fixture and gun assembly recently developed for 1942 model automobile grille as-



semblies by the *Progressive Welder Co., Detroit.* Three guns are mounted on arms projecting from a slide, so designed that the 17 welds necessary could be performed in groups of three in five different positions of the guns, while in the sixth position only two of the guns are actuated. This was done by providing the slide carrying the guns with an automatic indexing device. When the welds are completed, the slide moves the guns to the starting position and stops, permitting removal of the assembled grilles and reloading. The guns are of standard Progressive hydraulic design, while the contacts are of the stationary roller type.

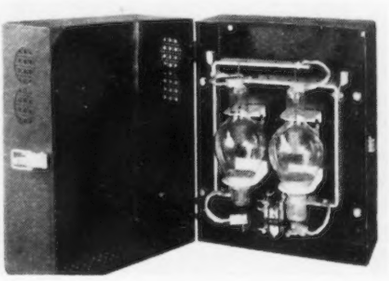
Crater Formation Eliminator

THE "Stroco" crater eliminator, an auxiliary device mounted on the body of the arc welding generator, eliminates abrupt breaking of the welding arc, which causes crater formation in arc welding and its undesirable porosity and depression in the contour of the weld. *Wilson Welder & Metals Co.*, 60 East 42nd Street, New York, designed the unit for use where the presence of the typical crater at the end of a weld deposit is objectionable. The "Stroco" is connected in series with the excitation field of the generator and controlled by a switch that enables the operator to cut it in and out of the excitation field circuit at will. In the circuit, it functions as a variable resistance of large enough capacity to build up the resistance in the excitation field and thus lower the field, making it possible to reduce the current density gradually without disturbing the current setting of the welding generator. It is thus possible to accomplish a tapering off or a fading of the current instead of an abrupt change, eliminating weld deposits that are porous at the end and permitting a smooth, even contour instead of the typical depression.



Tube Contactor

A NEW tube contactor, based on the development of what is claimed to amount to a revolutionary new power tube, has been announced by *Weltronic Corp.*, Detroit. Simple to install, the new contactor can be used on large and small welding equipment, the small equipment previously being outside the range of capacity of elec-



tronic types of contactors. Designed primarily for use in connection with spot, projection, and butt welders, the new "Stat-o-Tron" contactor requires only the making of four electrical connections to complete installation in the field. Water cooling of the contactor tube has been eliminated by its new design, simplifying installation and operation. Also, protecting load resistors and rectifiers are not needed. The new contactor contains two air-cooled "Stat-o-Tron" tubes arranged to perform the same general function in conjunction with resistance welders as does a magnetic contactor. Tubes will operate on 220, 440, or 550 volts, and the contactor can be used with loads as low as 5 kva, with a.c. or d.c. current.

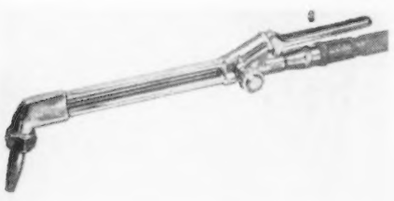
Welding Positioner

AN improved heavy duty 3000 lb. capacity welding positioner was recently introduced by the in-

dustrial division of *Ransome Concrete Machinery Co.*, Dunellen, N. J. The newly designed positioner has a 40 in. square machined table top provided with four radial and four longitudinal T-slots to take ¾-in. bolts for making quick and easy set-ups of pieces to be welded. A 3000 lb. load with a center of gravity 12 in. above the table and 12 in. eccentric from the center of the table may be carried. A tilting motor tilts the table from horizontal to 45 deg. beyond vertical, and the table top may be rotated at constant or variable speed.

Cutting Torch Attachment

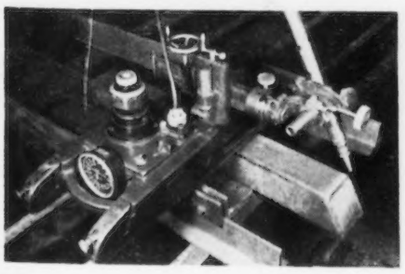
THE Rego KXA attachment that fits Rego SX, GX, LGX, and XGX welding torch handles, made by the *National Cylinder Gas Co.*, Chicago, matches the perform-



ance of most regular cutting torches. Its increased body length of 12 in. and an extra long, high pressure lever, result in better operating control and better balance. Its hard, non-warping, forged alloy head withstands terrific heat developed in heavy cutting and is abrasion resistant to prolong life of threads and seats. Standard Rego KX cutting heads, which have a proved record of economical operation that comes from the fast preheat starts, narrow kerfs and clean cuts, are used in this cutting attachment.

Cutting Torch Holders

EXTRA convenience and accuracy in setting Radiagraph cutting torches for any desired angle of cut is now possible by the new protractor type torch holder, made by the *Air Reduction Sales Co.*, 60 East 42nd Street, New York. A circular knob permits angular adjustment, as shown in the photograph, and the new holder, which has a 90 deg. angle range, can be attached to any standard Airco Radiagraph.



Acetylene Generator

A NEW, portable acetylene generator for use in oxy-acetylene welding and cutting has been introduced by the *Linde Air Products Co.*, a unit of *Union Carbide and Carbon Corp.*, New York. This Oxweld MP-10 generator will deliver 30 cu. ft. of acetylene per hr., and



is suitable for welding metal up to ⅜ in. thick and for cutting steel up to 5 in. thick. The pressure of the gas delivered to the blowpipe is controlled by a regulator and a gage indicates at all times the pressure in the generating chamber. Relief valves vent any excessive pressures that develop in the generator or in the delivery hose, and a hydraulic back-pressure valve prevents any reverse flow of gas. The unit is easily recharged, using 15 lb. of 14 NC Union Carbide.

Clean Welds

FOR welding jobs that must be neat and free from spatter, *Thompson & Co.*, Pittsburgh, developed "Anti-Spatter" to allow for its easy removal. When "Anti-Spatter" has been applied to a job before welding, all of the spatter can be easily brushed off. It is easily applied with a paint brush, and readily brushes off the job after welding has been completed.

Cast Iron Electrode

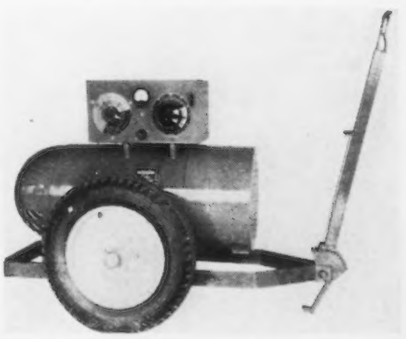
DEVELOPMENT and perfection of cast iron welding electrode has been accomplished recently by the *American Agile Corp.*, Cleveland. Known as the Agile Yellow rod, it completely eliminates the necessity of preheating the object to be welded, which has been necessary in the past. The weld metal deposit is soft and in the fusion area is not over 220 Brinell, which makes it readily machinable.

Welding Bench

TWO new welding benches have been developed by *Lyon Metal Products*, Aurora, Ill., for use in vocational and machine shops, garages, and welding shops. One bench was specifically designed for gas welding, and has a frame built to support a fire brick top 34 in. from the floor. The bench has a shelf with four separators for welding rods and additional storage space. The other bench is for arc welding and has a 35 in. high shield on the back and sides of its working top, 33 in. from the floor. This table also has a shelf and rod separators.

Welding Cart

A NEW two wheeled light, pneumatic tired trailer for mounting arc welding machines for easy, fast portability in shop, yard, or on the road has been developed by the *Lincoln Electric Co.*, Cleveland. The combination tow bar and standing support has a hand oper-



ated ratchet for locking the support arm in position, assuring an even, steady balance. It can be moved by hand, or hitched to a truck or car and towed.

Nicainor Kendall



1834

WHEN Nicainor Kendall pulled his rifle from under the robe of his sleigh, the hammer caught and the piece went off — nearly killing his fiancée. This accident led him to design the peculiar "underhammer lock" — one of the first safety devices ever built in a firearm. Not only was it safer, but this lock was simpler. It had fewer working parts — and parts were interchangeable from lock to lock. Here is one of the earliest examples of successful application of a fundamental principle of modern machine tool technique. Other examples have followed in constant succession. Thus, from Nicainor Kendall's little Vermont shop, Jones & Lamson Machine Company traces more than a century of continuous progress.

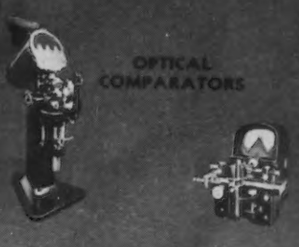
JONES &



Jones & Lamson Automatic Thread Grinder Model TG-615.



AUTOMATIC THREAD GRINDERS



OPTICAL COMPARATORS



RAM TYPE UNIVERSAL TURRET LATHE

strove for safety

and achieved simplicity

THE underhammer rifle that Kendall first designed has long been superseded by faster, more accurate, more powerful weapons. The mechanical principles by which Nicainor Kendall worked have long been the common property of progressive engineers.

But leadership in the application of those principles did not die with Nicainor Kendall. Nor did it die with men like Robbins, Howe, Hilliard and Hartness, whose successors are responsible for the most recent advances in Jones & Lamson machine tool technique.

As a result of these advances, modern Jones & Lamson machine tools, optical comparators and threading tools embody numerous unique advantages.

In Jones & Lamson machine tools, these advantages are apparent, not only in refinement and ease of operation, but in ample reserves of speed, rigidity and useful power, enabling you to make the fullest possible use of each new development of hard alloy cutting tools. Thus you can speed production for defense and be prepared to meet the keen competition of a postwar world.

Write today to Jones & Lamson engineers regarding your production problems. Inquiries from large plants or small receive prompt and thorough study here.

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Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers

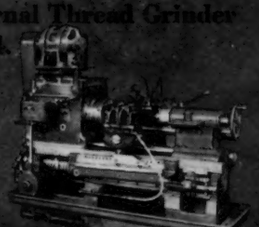
J&L

PROFIT PRODUCING MACHINE TOOLS

Jones & Lamson Automatic Internal Thread Grinder Model TG-624



SADDLE TYPE UNIVERSAL TURRET LATHE



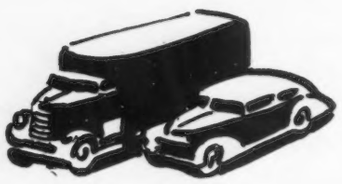
FAY AUTOMATIC LATHES



AUTOMATIC OPENING DIE HEADS

Assembly Line . . .

• To comply with new order eliminating bright work, automotive assembly lines will shut down about Dec. 15 and change over to lacquer, paint, plastics, etc., leaving large stocks of parts which may be sold for replacement work, or scrapped.



DETROIT—Because of changes in production lines and along automotive assembly lines incident to the elimination of all bright work for trim, the automobile industry will undergo a widespread shut-down of its production facilities about Dec. 15. In some cases substantial parts of the front-end sheet metal and trim will have to be replaced to accomplish the required change. The bright work ban affects all trim containing aluminum, copper, nickel or chrome (except bumpers or bumper guards on which certain exceptions will be made if the manufacturer asking the exception is able to demonstrate that every other possible step has been taken to conserve these materials).

In effect, the change-over is comparable to those which usually occur in the summer months when new models are being prepared for introduction. And in some measure, it is possible to think of the cars which will come off the line after Dec. 15 as new "blackout" models. In some cases there even will be "previews."

The length of the shut-down is not known yet. A General Motors official declared last week that the shut-downs would be of the "usual length." On that basis, it would mean that a minimum of one week shut-down could be anticipated. Some firms may require a shorter period and some may take longer, depending upon circumstances. One of the factors conducive to a long shut-down is the fact that new automobiles are piling up in the hands of retail dealers in many parts of the country.

JUST which plants will be shut down is not known yet. That most General Motors plants will have a shut-down is already known, and Chrysler has unofficially confirmed that its plants will undergo a similar shut-down, but the length is not specified. A Chevrolet advertising official insists that there will be no need for any shut-down in Chevrolet of any considerable length.

Ford is definitely an exception to the rule because officials state that their change-over will be gradual, in fact, is going on now from day-to-day, and will be complete by the deadline date.

Ford is one of the few firms that has not been caught with a large stock of bright work on hand. It will probably finish out the use of bright work as long as parts are available and then make the change-over to lacquer, paint, plastics, etc. Both General Motors and Chrysler plants have stocks of bright work on hand, varying in size. Some plants are reported to have enough bright work to last all year, attributable in part to the normal procedure of buying and fabricating materials ahead of time, and also attributable in part to some anticipating that was done by buyers last spring.

The stocks that are left over may be sold as replacement parts, but it is also possible that large quantities of stainless strip or chrome plated strip and moldings will be scrapped.

SOME experts hold that elimination of bright work is a good thing for the industry because it will permit designers to seek once again to accomplish their aim by incorporating pure beauty of line, contrast of paints and other devices to enhance appearance. On the other hand, there is ample justification for much of the bright work on today's cars. Bumpers and bumper guards have employed plating as the best possible finish to withstand the rough treatment that these parts sometimes get. The industry would be very hard-put indeed to substitute some other type of finish on these parts right now, although experiments with various types of paint are going forward. Bumpers and bumper guards are subject not only to scratching and marring from contact with other cars, as when they are being parked, but also get badly marked from pebbles on the road surface.

Similarly, hub caps have been plated in the past as a means of avoiding denting and scratching and pebble marring. It is easy to point to a large number of automotive parts on which plating is justified. Radio aerial masts, for instance, whip around in the wind so much that most surface coatings would crack and peel off. Windshield moldings, door handles and some of the running board moldings get an obvious protection from plating.

The cars which will be introduced soon as "blackout" models will not be too bad to look at, although some of them will be a little somber looking. However, the use of bright, contrasting colors for trim goes a long way to offset this effect.

The sales picture of the automobile industry is one that is wrinkling many brows. Automobiles are not being snapped up by customers as rapidly as many thought when they first heard of the sharp curtailment ordered by OPACS and OPM. Today cars are selling freely in some areas, particularly those which already have a lot of defense work underway, while they are moving slowly in other areas. There is a spotty condition throughout the country, with a sellers' market existing in some sections and a buyers' market in others. Whether a sellers 'or buyers' market will prevail generally is hard to tell, but those who once predicted that the 1942 cars will sell themselves have changed their minds.

OVER all it is apparent that dealers' inventories of new cars are piling up—not piling up at a rate great enough to cause consternation — but fast enough to cause considerable worry. Some sources in the industry are fearful



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THERE are 10 Bullard 6-station Mult-Au-Matics in this battery, doing their part to speed up aeroplane engine production. They are rough turning, facing and boring 60-lb. nitralloy steel cylinder barrel forgings. The manufacturer says they have reduced the time one-third and saved a tremendous floor space over the single spindle machines formerly used for the job.

The Mult-Au-Matic method of individual feeds and individual speeds at 5 or 7 working stations, all operating simultaneously, is adaptable to a tremendous range of machining operations —and almost always at substantial savings of time, labor, floor space and cost.

BULLARD

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT

that the pile-up will be construed by defense officials as an excuse for further slashes in production schedules beyond the 50 per cent curtailment now visualized. However, their analysis of the situation provides ample reason to believe that all the stocks of cars now on hand will be moved in the first rush of spring buying and that it will be easy to move the rest of the year's production.

The piling up of stocks has been attributed to the following detrimental factors:

1. There were no auto shows this fall except a very few local exhibits and open house week. The failure to concentrate the public mind on the new models is admittedly one of the reasons for the lower sales totals. One of the industry's most important sales executives says that he would discount sales at least 10 per cent because of the absence of shows. He, himself, by the way, was one of the original advocates of cancelling the national automobile show because he thought the industry should do this to show its all-out intentions for defense.

2. Taxes, wages and cost of materials have boosted the price of cars, and this, accompanied by an unexpected restriction of installment terms, produced a chilling effect on automobile sales.

3. Buyers bought "into" the 1942 model year by about 25 per cent to beat taxes and price raises, it has been estimated.

These deterrents to automobile buying came at a time when the automobile business was so good that the retailers were not anxious for more sales. They have had a good year, are in strong financial position and will have to pay substantial taxes on their 1941 incomes. Any further income during the remaining weeks of the year will boost them up in the higher income tax brackets or will cause them to pay higher corporation taxes if their sales organizations are incorporated. As a result, they would prefer to sit back and accumulate stocks and not begin their real sales drive until after the first of the year.

The industry's thinking executives are urging that retailers keep their stocks moving, however, to avoid the aforementioned possibility of further unjustified curtailment in production.

PRODUCTION has already been curtailed so much that automotive employment is suffering seriously. Relief was sighted last week when it was revealed in Washington that the Army finally has been pursuaded to change its buying policies and speed up motor truck purchases. It is believed that shortly Congress will be asked for additional appropriations so the Army can place orders immediately for thousands of trucks which originally it did not intend to buy until next year, or later. The move was a direct response to appeals by Michigan political, industrial and labor groups to relieve a situation which might have resulted in lack of employment for 250,000 or more men. Even with the easing of the situation, however, employment still will be Michigan's most serious problem during the winter and spring months. It is impossible to estimate what the benefits of the Army buying policy change may be because the number of vehicles to be purchased has not yet been indicated.

A better estimate of Michigan's status as a military tank producer is now possible, although final data and official figures are lacking.

Chrysler's tank arsenal is now stretching up toward the 15 tanks a day, which will represent the ultimate capacity of the present plant. Next spring it will switch over from the M-3 model to the M-4, which will have the 75-mm gun in a full-revolving turret. At the same time it will be expanding its production in the direction of 750 tanks per month, which is more than double its current production. Plans have been laid for an ultimate expansion to 45 tanks per day, possibly even 60. Whether that ultimate goal is ever reached, or even officially aimed at, the present doubling of expansion will call into play a great many of Chrysler's production facilities. Its three assembly lines will be increased to six, the plant will be made 100 ft. wider and 700 ft. longer within the next three or four months. At the same time, other Chrysler production facilities will be called into action, including the present ones at Plymouth and quite likely at Briggs, one of Chrysler's important suppliers. Briggs is reported to be preparing to manufacture tank turrets in its tool and die shop. (This is in addition to the airplane turrets which will be manufactured in a new Briggs plant, and there is no connection between these two turret projects.)

FORD received a letter of intent early this month to make 400 tanks per month, plus parts for other builders. The firm recently began, on its own initiative, an expansion of its casting facilities so it can make 300 tons of cast parts daily. In addition to that, it will undertake to convert one of its mills for rolling tank armor plate. Ford is believed to be scheduled for production of 60-ton tanks in addition to the 28-to-30-ton medium tanks, but this is not official.

General Motors is officially slated to manufacture both the 60-ton tanks and the medium type. From this source it is learned that a great deal of welding will be employed on the new model tanks. It is assumed that this means that when Chrysler and Ford go into production on the M-4, those tanks, too, will be welded. The General Motors project is one made public when Fisher Body was allotted more than $25,000,000 worth of Defense Plant Corp. funds for plant facilities and equipment.

The Fisher tank plant will prob-

(CONCLUDED ON PAGE 121)

NEW MACHINE GUN: Capt. Melvin M. Johnson, Jr., of the U. S. Marine Corps Reserve, is shown testing his new light machine gun which, according to its inventor, breaks into three parts and can be assembled in 30 sec.

Associated Press Photo



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Washington . .

• Seriousness of raw material shortage is brought out at Armistice Day seminar for steel industry in Washington . . . Navy admits it is hoarding steel . . . Army says that since M-21 came out, steel shortage has increased.

WASHINGTON — The seminar the OPM held with the entire iron and steel industry on Armistice Day appears to have proved mutually profitable. Fortunately it did not turn out to be a session of the Mutual Admiration Society. At the same time neither the government nor the steel representatives were very sharply critical of each other.

At points some government representatives had rather barbed comment because of so-called steel shortages or delayed deliveries. Criticism by steel representatives of the execution of the defense program was mild.

It may be that the OPM is not operating the steel defense program with the efficiency that the industry would like to see. But its representatives pretty well confined comments on the subject to the belief that after those in charge of the iron and steel branch get a better understanding of the industry's problems, the program will work more smoothly.

THE seriousness of the raw material shortage was brought out by R. C. Allen of the OPM Iron and Steel Branch, who said that it appears that although in 1942 on the basis of capacity then existing, 87,000,000 tons of steel could be made, actually production will fall short by about 4,000,000 net tons on account of a pig iron shortage of 6,400,000. This would be 80,600,000 tons as compared with an estimated production of 82,000,000 tons for 1941, a sharp falling off in the face of the capacity expansion.

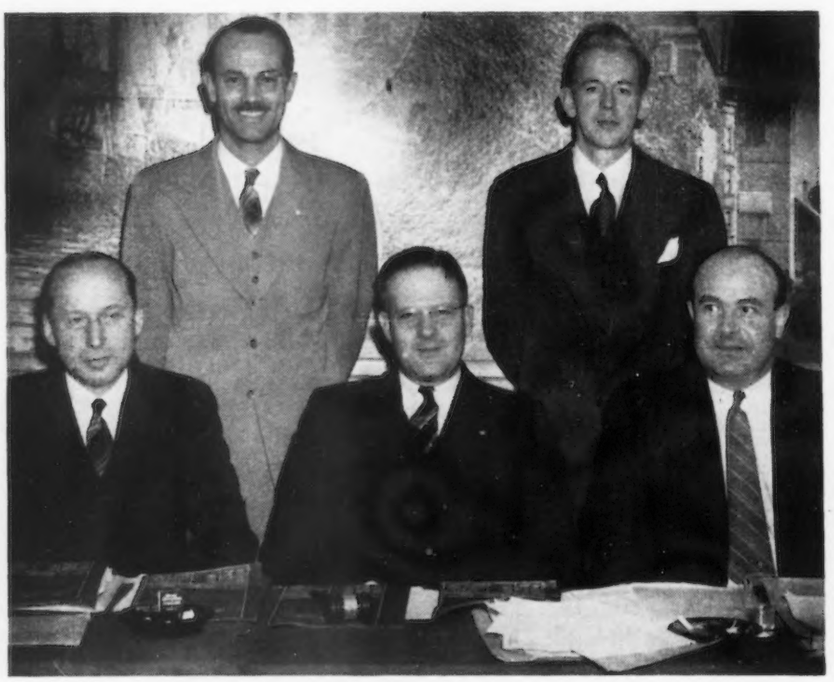
Even a worse picture was painted for 1943, in which year Mr. Allen estimated capacity at 93,000,000 tons, but he said production will fall short by about 7,000,000 tons on account of a pig iron shortage of 9,800,000. This would mean 1943 output would be 86,000,000 tons, which OPM estimated as the present steel-making capacity, though in the industry it is estimated that capacity will be above 88,000,000 tons early next year.

COMPLAINTS of steel shortage laid before the steel industry by government officials started with Admiral Emory S. Land, chairman of the Maritime Commission.

In 1942 and 1943, Admiral Land said, the Commission wants to build 6,000,000 tons of shipping for each year. The Commission, he stated, will require to complete these ships and continue its program into 1943 approximately 2,200,000 tons of plates and shapes for delivery in 1942. He said the Commission at present has a steel plate deficit of approximately 80,000 tons.

Under-Secretary of the Navy James V. Forrestal said that during the past six months the lack of steel has slowed down the Navy's defense effort in many cases. During one month, he said, the shipyards reported a shortage of 60,000 tons of plate alone for naval construction. He conceded that the shortage situation has been due in large or at least some part to the failure of properly scheduling in the yards themselves, "and it has also been due, as you men know as well as I, to the failure of the mills from time to time to deliver." He said steps have been taken to rectify the situation in the yards.

PLAN AIRCRAFT STANDARDS: The National Aircraft Standards Committee met in Hotel Lexington, New York, last week to survey the first year's work as a national group. New officers are shown above. Seated, left to right, are: C. T. Torresen, North American Aviation, Inc.; John F. Cramer, Boeing Aircraft; J. T. Thompson, Glenn L. Martin Co. Standing, left to right, are N. S. Houston, North American Aviation, and J. T. Gray, Aeronautical Chamber of Commerce. Much progress has been made in the past year, reports showed.



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ANY feature that keeps a machine running, regardless of the hours or how hard it is "pushed" for production, is an important contribution toward National Defense. In the CINCINNATI Hydraulic Universal Grinders, oiling is principally a function of the machine. Herein lies the secret of smoothness of operation and exceptionally low maintenance cost.

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CENTERTYPE GRINDING MACHINES . . . CENTERLESS GRINDING MACHINES . . . CENTERLESS LAPPING MACHINES

and expressed the hope that the mills will take equal and efficient steps to meet it from their point of view.

IS the Navy hoarding steel? Very definitely, Yes. The Under-Secretary admitted that the accusation is at least partly true. He cited a boast of an admiral to emphasize the point.

"We have been accused of hoarding," said Mr. Forrestal. "As Admiral Spear said in response to a question one day from Mr. Knudsen, 'You are damned right we have been hoarding. We are going to keep on. We need to.' I think the accusation in some part is true. On the other hand, we must keep certain stocks on hand to meet unforeseen and unforeseeable exigent emergencies."

An unforeseeable circumstance was cited by Forrestal. He said that to repair a British warship at Norfolk, Va., it was necessary to scour the yards of the Atlantic seaboard to provide steel plate.

John J. McCloy, Assistant Secretary of War, said the Army was not getting enough steel for its procurement program, and that since the issuance of the OPM order, M-21, designed to facilitate procurement of steel for military use, the situation had become progressively worse instead of better. Mr. McCloy complained that the Army's priorities are low compared with those of the Navy.

MCCLOY said information from Great Britain was that 10 per cent of the steel she will produce and that she will receive from the United States in 1942 will be used for civilian existence and maintenance and that 90 per cent would be used for her war effort. It was assumed Germany's steel is being utilized in about the same ratio.

The Lend-Lease aspect of the program was discussed by Assistant Lend-Lease Administrator Thomas McCabe. He spoke for Administrator Edward R. Stettinius, Jr., who was unable to attend the conference. Mr. McCabe said that only $133,000,000 out of the $7,000,000,000 had been allocated directly to steel, but that $1,444,000,000 had been allocated to ordnance, $743,000,000 to ship construction, $2,600,000,000 to aircraft, and $61,000,000 allotted to machine tool purchases, and $427,000,000 to automotive vehicles, a total of $4,981,000,000. Completion of the $7,000,000,000 program, it was said, would occur by the end of the month.

A RUMPUS was stirred when President Thomas Akin of Laclede Steel Co., speaking of the scrap shortage, declared that he could not see why the Administration should not have an administrative office that would "coordinate the thing so we would know first what we are expected to do, what we can do, and what we can depend on in the way of raw materials."

Stepping up briskly to the microphone, Mr. Whiteside, with some heat, said that he thought some agencies in Washington can do quite a bit, "but if anybody in God's world can tell me where the scrap is coming from or going to, or will flow, without more detailed information than is available at the present time I would like some suggestion." Mr. Whiteside, whose resignation from OPM was announced last Thursday, said that he could not see "how we can give anybody assurance that they will get an indefinite amount of scrap in the future."

SUMMARIZING the government's demands on steel, Mr. Whiteside told the industry it has 40,000 customers and is 500,000 tons delinquent in filling defense orders, and 30 days behind in civilian demands.

"The priority rating system must be adhered to, and that is the purpose of this meeting," he said by way of indicating that the allocation system will not entirely supersede priorities.

Dr. George B. Waterhouse, who discussed the ferroalloy situation, said that at present this country is not producing more than 3 per cent of the grade of ore needed. In the coming year 100,000 tons will have to be brought in each month, roughly one-half to come from this hemisphere. Regarding nickel, he estimated the direct defense industries in 1942 will use 204,600,000 lb. He saw a possibility of getting more from Canada, but not a whole lot more. Imports of chrome ore in 1942 were estimated at 900,000 tons while domestic production was estimated at 125,000 tons.

THE BULL OF THE WOODS — BY J. R. WILLIAMS



IS THERE A WAY TO GET CARBOLOY TOOLS ON THE JOB FAST UNDER PRESENT CONDITIONS?



FALK CORP. SAYS *Yes!* "HERE'S HOW". . . . . .

When Falk Corporation, Milwaukee, needs specially shaped carbide tools *fast*—it's a matter of *minutes*—and the job is done!

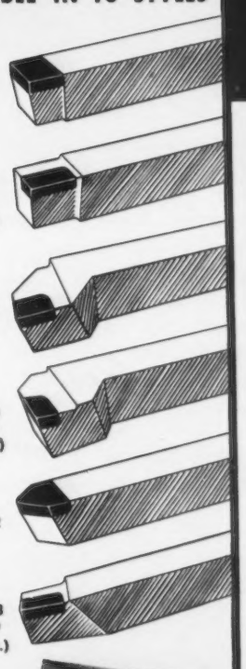
Take the above job, for example: Machining reduction gear blanks for the main drive of Uncle Sam's destroyers. 14 "specially" designed carbide tools required. Falk "makes" these specials—ready to go—in 135 minutes!

Here's how Falk saves weeks on not just this one job—but on 86% of their carbide tool requirements:

From the 10 styles of Carboloy Standard-Stock Tools—now being manufactured in "mass production quantities" for "universal" use on turning, facing, boring jobs—Falk has selected 9 styles to maintain in stock in their tool room. When specials are needed, Falk adapts the "standards" by quickly grinding the shape desired. Usually no more than a 10-minute job per tool—and as easy to do as the average regrinding of dull tools.

A 12-page booklet tells the story. Free, upon request.

STANDARD TOOLS ARE AVAILABLE IN 10 STYLES



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"You ALWAYS Get Standards FASTER Than 'Specials'"



FREE 12-PAGE BOOKLET

WEST COAST . . .

• Shipyards getting better cooperation on delivery of materials but forged and cast valves, tubing and fittings are still difficult to obtain when wanted . . . Better coordination of rolling schedules and construction schedules needed.



BETTER cooperation between the Maritime Commission, OPM and steel suppliers has been evidenced in material deliveries to some major West Coast shipyards during the last three weeks, but deliveries are still behind schedule at nearly all yards. Inability to secure prompt deliveries of small size tubular products, valves and fittings continues to cause major outfitting worries to nearly all builders, although tonnage steel suppliers have not kept pace with the yards.

Evidence that even A-1-a priority ratings are no guarantee of prompt delivery on ship plates is shown in delivery delays to holders of Navy and British ship contracts. The suggestion that the difficulty lies in inability of the railroads to handle the large volume of steel shipments is belied by delivery delinquencies even on light products rolled by Coast mills. Efforts of mills to relieve the pressure are shown in one builder's statement that he had been asked to withdraw some of his orders.

Despite these difficulties definite improvement has been shown to such an extent that if the present trend continues until the first of next year, materials, for the most part, will be arriving on schedule.

Western Pipe & Steel Co., building Maritime Commission ships under the long range program at South San Francisco, which two months ago was considerably slowed down by plate shortages, now gives great credit to the steel companies for having nearly caught up with commitments.

Bethlehem shipbuilding division, San Francisco, has experienced no delivery delays sufficient to retard work on its Navy contract.

RICHMOND SHIPBUILDING CORP., Richmond, Cal., building emergency Maritime Commission cargo ships, which two months ago was unable to lay keels although steel was piling up for later stages of construction, now has ships under construction on all six ways, and if deliveries continue as promised during November, material schedules will be fulfilled to date. Building has been definitely slowed at this yard to date by spotty steel deliveries, particularly through arrival of steel in improper sequence.

Less than a mile away, the affiliated Todd-California Shipbuilding Corp., building cargo vessels for Great Britain, continues to work under the handicap of steel arriving in progressively more muddled sequence, behind schedule. This yard, which installs its boilers before launching, is particularly susceptible to delays in pipes, valves and fittings. Efficient outside buying of critical parts has thus far been of material aid, but time lost when one way was idle cannot be regained.

Moore Dry Dock Co., Oakland, contractor for both Maritime C-2 cargo vessels and Navy submarine tenders and rescue vessels, continues to postpone launching dates of the former as steel deliveries, particularly plates, continue to show no improvement. All types of steel have been short at this yard.

At Los Angeles Harbor, California Shipbuilding Corp., building Maritime Commission emergency cargo vessels, so far has been able to meet launching dates, but faces indefinite delays in outfitting three hulls already launched.

At Seattle and in British Columbia, plenty of steel is reported on hand and work going forward on schedule. Seattle work has been delayed by a welders' strike, but this trouble has been smoothed out, temporarily at least, and full crews are now at work. Seattle-Tacoma Shipbuilding Co. has ten ships on the ways. Associated Shipbuilders has two vessels on the ways and is fabricating steel for two more in its shops. In Vancouver and Prince Rupert, British Columbia, where approximately 20 10,000-ton merchant vessels are being built following British plans, steel is coming through, and fabricators declare the Canadian priority system is working well.

Taking the Pacific Coast situation as a whole, it is evident that forged and cast valves, tubing, and fittings, now constitute the No. 1 bottleneck rather than the more widely publicized steel plates. Plates still are the most serious shortage in the tonnage steel classification. Shapes are arriving in some yards as ordered.

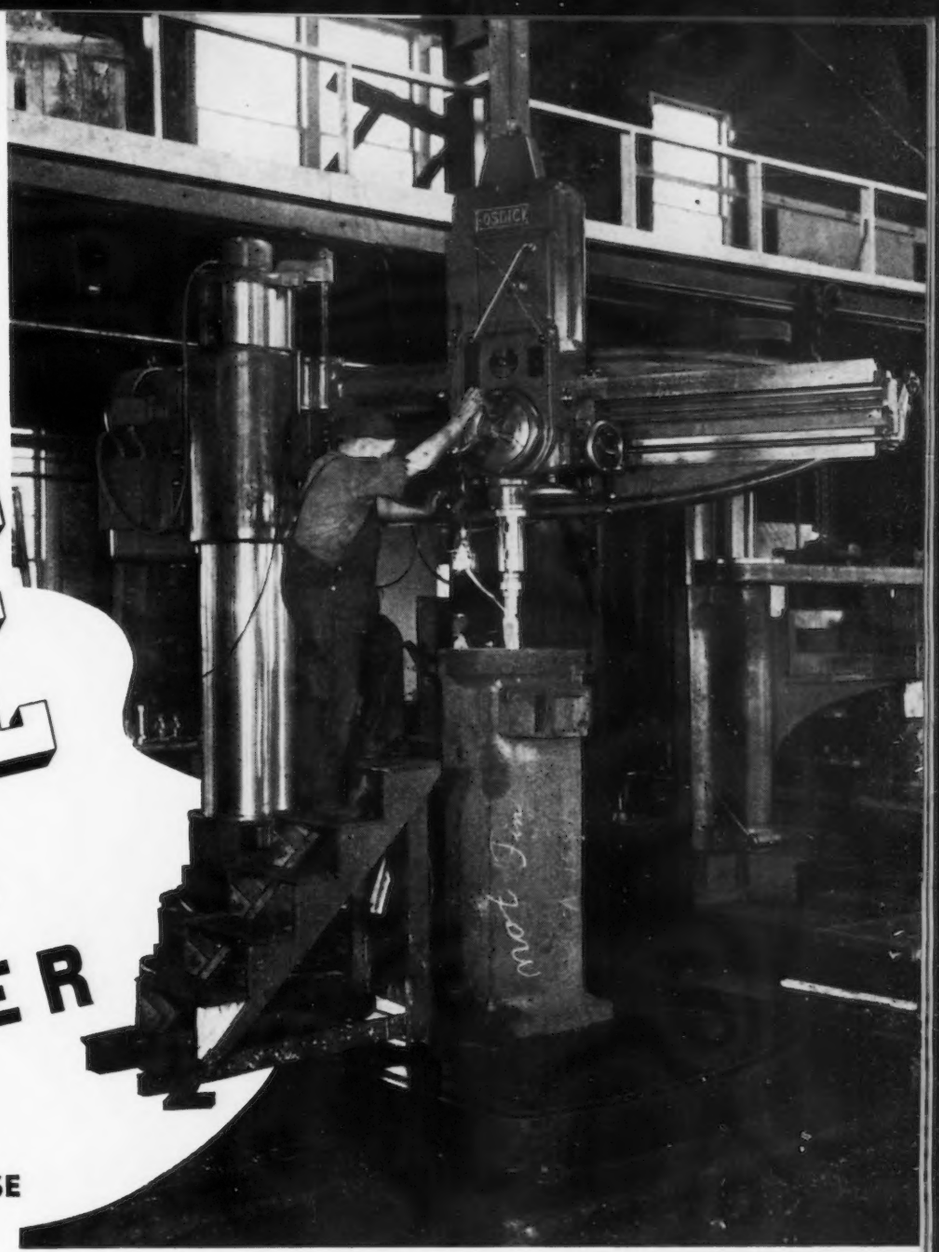
ONE shipbuilder, who two months ago sharply criticized the OPM allocation system and failure of mills to understand or meet shipbuilders' problems, now declares that many of the bumps have been ironed out, and that steel suppliers as a whole, are more familiar with shipbuilding procedure and requirements.

Apparent inability of mills to coordinate rolling schedules with shipbuilders' construction schedules still is piling up temporarily sterile tonnage at the yards, and it may be conjectured that quite a substantial tonnage of badly needed steel items is tied up in this manner in the country as a whole. The problem is not that of any one yard, but, according to the builders, probably results when a mill rolls immediate requirements of one yard, then continues on the same item for another yard where it is not required until well into the future. The mills are not criticized for this, but it is felt that the national schedule could be better meshed to avoid this situation.

Some outright delays are still apparent. One yard still has not received steel which was due in July, and has only received steel dated for August within the last three weeks.

One mill, in particular, has been overloaded with plate allocations, it is stated, and some concern is felt over the apparent vulnerability of this mill to labor difficulties. Any curtailment or shutdown of mills' rolling plate requirements at this time would be disastrous to the Pacific Coast shipbuilding program.

Announcement that the OPA will



SAFE ON A LADDER

. . . BECAUSE

FOSDICK Radial Controls are easy to operate

● Here the operator is required to use a ladder to operate a Fosdick Radial due to the nature of the work being drilled 8 feet from base to bottom of arm.

This typically illustrates two pertinent qualities of Fosdick Hydraulic Radials . . . adaptability and capacity for a wide range of work and simplicity and ease of control.

For instance take the head—all controls for entire operation of the Economax Radial are conveniently located on the head. Operator can finish an operation from working position and has selection of 36 spindle speeds instantly available in the head.

If yours is a Radial job . . . do it better . . . faster . . . more economically on a Fosdick Economax Radial. Bulletin R.A. gives complete construction and design features.

Write for a copy

Built in SIX SIZES

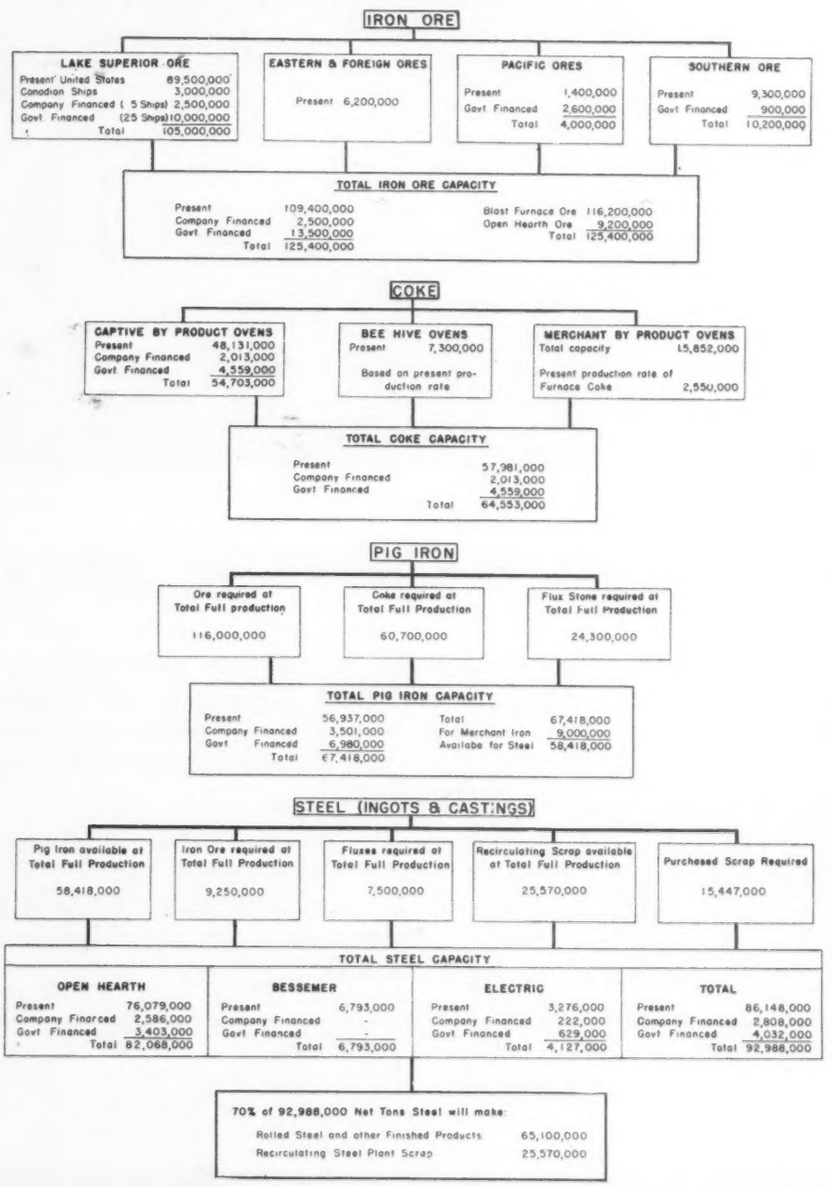
to accommodate a wide range of work . . . 3-4-5-6-7 and 8 foot.

FOSDICK MACHINE TOOL COMPANY

CINCINNATI . . . OHIO

establish a San Francisco office early next month to oversee administration and enforcement of the iron and steel scrap price schedule in California, Oregon, Washington and hinterland states, was welcomed locally as a step toward stabilizing transactions, but by no means settling the scrap supply situation. William S. Whitehead, representing the price division, and Harold Swope of the legal division enforcement section, were due to arrive in San Francisco this week to begin preliminary work. Recognition by the OPA that the Pacific Coast demoralized price situation, particularly in foundry grades, could only be permanently corrected by a local office, confirms assertions reported in THE IRON AGE for some time. It is difficult to see, however, what means this office can take to stem the growing practice of foundries taking work for which the customer supplies the scrap. If this practice becomes more widespread, it will take a young army to check up on dealer-customer transactions. The more fundamental problem of assuring flow of scrap from remote areas within the states of California, Oregon and Washington will not be helped by the office, and remote scrap flow may even be retarded where illegal premium prices have been paid to assure supply.

STEEL CAPACITY BY 1943: This flow chart of steel manufacturing represents the total existing capacity, plus the increased capacity privately financed by industry, and that specifically approved for financing by the government, which will not be completely built until the latter part of 1943. It is estimated that during 1942, the actual production of steel ingots will be 83 million net tons and in 1943 a total of 86 million tons. Deficiencies in scrap, pig iron, ore hauling capacity account, in part, for the spread between estimated capacity and production. (Source: Iron and Steel branch, Materials Division, OPM).



ITINERANT junkmen have practically disappeared from the Seattle district because of discouragement over low prices plus the lure of abundant national defense jobs. The ranks of those engaged in marginal occupations of this type have thinned almost to extinction from the impact of the huge load of defense industry piled on the normal small industrial base.

Although Coast welders seeking recognition of an independent union by the AFL were back at work last week, whether or not further trouble will be experienced appeared dependent more on the ability of the independent union to strengthen its ranks rather than on OPM labor division negotiations. The strike, as it affected Lockheed, Vega, and Consolidated aircraft companies in southern California, collapsed entirely from union weakness, particularly in failure of its efforts to win sympathy of other workers. Independent shipyard welders, back at work ostensibly pending an OPM sponsored conference with the AFL, are not unlikely to be able to gain sufficient strength to walk out again if the OPM conference fails, as well it may. Inasmuch as the coastwide shipbuilding stabilization agreement, in effect at nearly all yards, makes the AFL sole bargaining agent, the AFL is in good position both from a negotiating and propaganda standpoint, to work a forced play on independent welders' demands.

The AFL building trades two-day strike on Navy training and operations projects at San Diego seemed bound for final settlement last week, despite the Navy statement that it was "open revolt against the United States Government." The peace formula consists of the apparent guarantee that union demands will be met, and adds to the mounting evidence that the Navy is pushing all types of work with more frantic haste than other agencies without primary regard to cost.



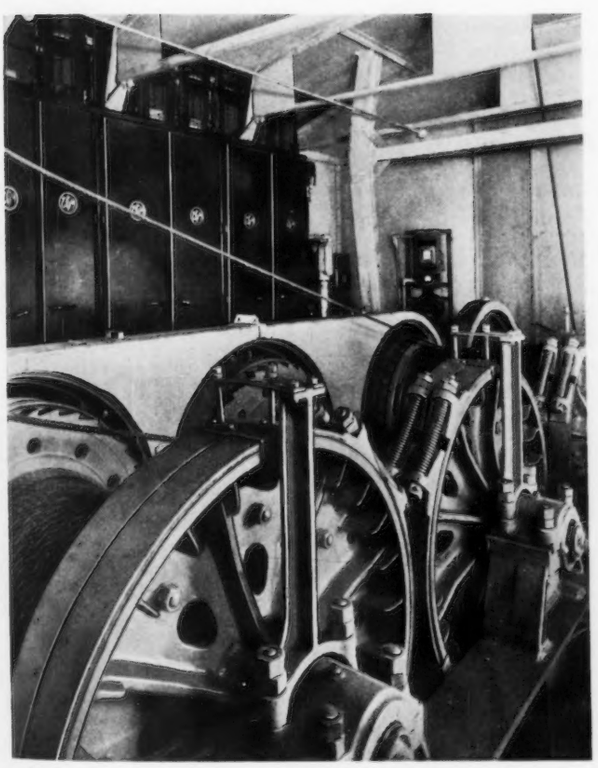


NO JAR • NO BUMP • NO JOLT

You can make a

CUSHIONED LANDING

When EC&M FREQUENCY RELAYS *Safeguard* A-c Motor Hoists



Interior view of crane showing EC&M Enclosed Controllers with Nickel Alloy Resistors on top of Cabinet. Compact EC&M Master Switches permit convenient grouping at operator's station shown in small view above.

AMERICA'S Railroads have a reputation for careful handling of *all* types of shipments,—large, small, heavy or bulky. One of the large Eastern railroads has recently improved its facilities with this new portal crane which is *outstanding* in its *ability* to lower a bulky shipment slowly through the restricted opening of a hatch or rest a heavy cargo carefully in the ship's hold.

The operator can attain results with this crane which previously have been impossible with cranes powered by A-c wound-rotor motors. The reason is that EC&M Frequency Relay Magnetic Control permits *weaker values of torque*—so essential to smooth and slow lowering of light and intermediate loads. It is perfectly safe to get slow speeds by means of these weak-torque points because Frequency Relays guard against overspeeding should these points be used to lower a heavy load.

Since the introduction of EC&M Frequency Relay Control, a new perspective has been drawn relative to A-c cranes. Engineers and management have been quick to alter their ideas on crane performance after witnessing this new control in operation. Perhaps there is an installation in your vicinity that can be visited. Consult with EC&M before writing A-c crane specifications.

THE ELECTRIC CONTROLLER & MFG. CO. E&M CLEVELAND, OHIO

Specify EC&M FREQUENCY RELAY Control for A-c CRANE HOISTS

Fatigue Cracks

BY A. H. DIX

Bulging Mail Bag

• • • Our public was liberal with its letters this week. From the stack of seven we will select six at random. The first out of the hat is from E. M. Loveland, works manager of McLaurin-Jones Co., Brookfield, Mass., who writes:

> We would greatly appreciate your sending us pamphlets entitled:
>
> "Working to Music"
> and
> "Without a Song"

Both are strangers to us, but we are, as they say, intrigued, for the second seems to be an antidote for the first. If Mr. Loveland succeeds in tracing them to their lair, we suggest as a companion piece the news item on page 43 of last week's issue regarding a new device called an "Ear Defender," which workmen can insert in their ears to shut out unwelcome sounds.

Ten Dollar Word

• • • The second is from Macdonald S. Reed of the Erie Foundry Co., who complains:

> You use the alliterative, compound adjective, **beautifully-buttocked**, forgetting that the Greeks had precisely the word for it, **callipygian.**

Callipygian got an airing here about a year ago, but it fell with a dull thud and we lost heart.

Career Book

• • • Next is a plea from Joseph Michael of Providence, R. I.:

> I am starting my career book on machinist and would like to have information that would help in making a good career book. Kindly send a copy of The Iron Age, something that would have pictures and information that would be good for a career book.

Joseph has been sent an appropriate issue in order that his career may be started with a bang.

Crinoline Fenders

• • • For fear of reprisals on the part of the automotive moguls, the name of the emitter of this squawk is withheld:

> Present-day designs of the front end of cars and its fenders remind one of the crinoline and bustles of bygone age when beauty was hemmed in by clothes so the young man could not get near enough to kiss his girl. Same thing in reverse in cars, small engine, hemmed in by broad skirts of steel giving the kiss of death when it strikes . . . It looks to me as if car body designers are ex-crinoline dress designers and ex-church altar builders judging by the cumbersome fenders and gadgets they hang on.

The front end of automobiles is, of course, but one example of the triumph of the aesthetic over the purely utilitarian. Other examples are padded shoulders, the olives in martinis, the double vertical rule on the left margin of this page, and the spray of parsley on your mashed potatoes.

They Send Us to Jail

• • • The sixth and last grain in the week's grist is from the Anchor Products Co., Philadelphia:

> After we have finished with copies of The Iron Age at the office, we send them to the Eastern State Penitentiary. They are gratefully received and the prison officials inform us that they are anxious to receive the copies, as they are used as textbooks in the various classes. Thus the inmates are given a chance to improve their education. Perhaps some of your other subscribers may want to do likewise with their copies.
>
> Good!

High Selectivity

• • • Your favorite family journal's New England advertising manager, D. C. Warren, thinks you should know that this classified ad appeared in a New England paper:

> Second-hand tombstone; excellent condition; wonderful bargain for family named Kelley.

Carnegie Biographical Note

> Andrew Carnegie was a breaker boy in a steel mill.
> —*Walter Winchell*

Or maybe a melter in a coal tipple.

Blurb

• • • Pardon us a moment while we pat ourselves on the back.

Each week the one big, more or less happy family of IRON AGE *readers hits a new high. . . . Up more than* 20 *per cent in* 25 *months. . . . The editorial, "When They Say 'No,'" has reached a quarter million circulation. . . . Advertising volume is* 24 *per cent above last year. . . . Mountain of newspaper clippings moves the modest brains department to object to claim, "Most Widely Quoted Trade Paper." Too restrictive. Should be "Most Widely Quoted Magazine." . . . Coming Annual Number, due Jan.* 1, *looks like a whopper. First engravings from advertisers came in Oct.* 25. *Earliest yet. . . . Demand for Priorities Guide continues enormous. Put back on press three times. New edition soon. . . . A. W. Kelly complains, "Now that* IRON AGE *has given us up-to-minute dope on priorities, I don't have time to read half your column before somebody is yelling to see what is new in this week's priorities." . . . Volume of letters from readers (most accurate reader interest pyrometer) never higher. . . . Continued heavy demand for chart of comparable tool steels exhausted supply. Being re-run on press . . . same with set of six steel comparison tables, comparing analyses, properties and prices.*

Thank you.

Hamlet Without Melancholy Dane

• • • Our favorite headline in last week's issue is:

Monsanto Seeks Substitute For Tin in Tin Plate Making

Orchids, 1; Tomatoes, 1

• • • An orchid to Jack Alexander for this sparkling simile in his article, "From Cellini to Gimbel to Klotz," in a recent Satevepost:

> Disposing of the Hearst art collection through dealers was like trying to empty an oil tanker with a medicine dropper.

But a rebuke to that master of imagery, Leon "Washington" Moffett, your watchman on the Potomac, for this maculate metaphor, ". . . *it will take a great deal to untangle the web and stimulate output.*" Webs are not tangled; they are woven. Snarls are tangled.

Puzzles

The Nov. 6 problem was incorrectly stated. It was a problem in division—*ab*) *cdeeb* (*bfd.* As the master minds saw at a glance, the final *d* should have been *b.* The digits are 35) 19775 (565. We tried hard to pin the mistake on the printers, but are pained to say that the fault is all ours.

Two minutes is par for this:

> The side of a barn is 60 ft. long and is 40 ft. from a road running parallel to it. A rope runs loosely along the 60 ft. side of the barn. A cow is attached to this rope by means of a loop which slides easily along the rope. What is the least length of rope that will permit the cow to graze on the field between the barn and the road without permitting her to enter the road?

Northern HI-LIFT HOISTS

serve manufacturing, storage and shipping operations at less cost

The combination of unusual flexibility, exceptional ease of control and high economy gives the Hi-Lift Hoist a wide usefulness. Sturdy construction makes it always reliable.

The load, large or small, is under the accurate control of the operator. He can lift, carry and spot with precision.

Hi-Lift Hoists are in use in every type of industry—steel mills, automobile plants, foundries, machine shops, tool and die shops, paper mills, structural plants, power plants and many other places.

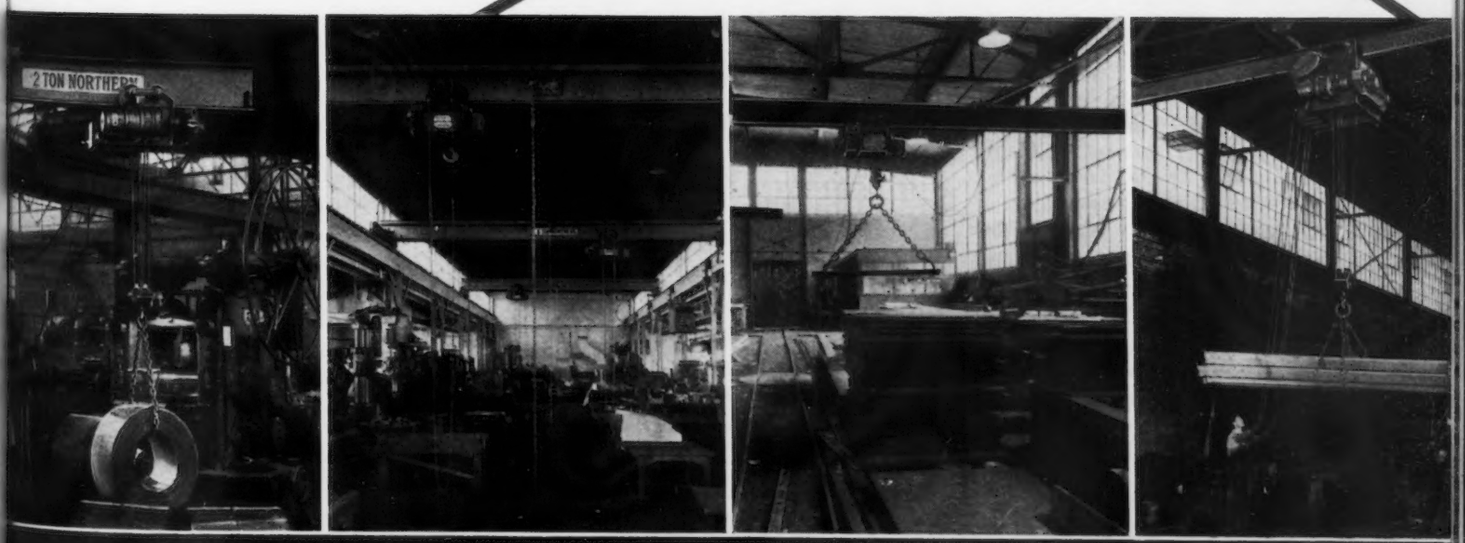
They are handling dies, castings, machinery, steel, paper, electrical material, automobile bodies and frames, lumber, stone, pipe, etc., at amazingly low costs, and with the high-lift feature are making better use of building space.

The Hi-Lift line is comprehensive—there is an economical unit to meet YOUR needs.

NORTHERN ENGINEERING WORKS

2688 Atwater Street

Detroit, Michigan



Typical Applications of Northern Hi-Lift Hoists in Various Industries

This Industrial Week . . .

CONSUMERS hungry for steel and steel producers afraid of a forced shrinking in their mill schedules at midweek found themselves in the same sea of uncertainty and fear.

The Lewis-CIO shutdown of the coal mines operating solely for the nation's steel plants threatened another great, irrevocable loss in steel production.

The national defense program, depending on steel as the basic material for war-making, stood to suffer if the coal strike, which started last Sunday night, continued through this week.

But a new sufferer from a defense strike—the civilian steel consumer, the man in the street—for the first time found himself on the receiving end of Lewis' blows for a universal closed shop—a system under which every man, to hold a job, must belong to a union.

Strike Hits Civilians

Defense plants, because of the importance of keeping them operating at full capacity, are certain to get the necessary steel as long as there is any left to ship. It is the civilian product plant, consuming steel, which will be the first to be hit if the coal strike continues.

For the first time, Lewis seemed to be ready, in the name of the closed shop, to shut off material needed for the already diminishing flow of refrigerators, stoves, washing machines and other peacetime products to the public.

A Republic Steel Corp. stack at Gadsden, Ala., was the first to go out of blast (Nov. 17) as a result of the latest coal mine shutdown. Then Woodward Iron Co. of Birmingham, Ala., closed a blast furnace. Almost all the country's steel capacity was jeopardized by the strike. On Monday and Tuesday of this week, a large number of mine workers refused to obey the strike call. Both U. S. Steel Corp. and Bethlehem Steel Co. and other mine-owning steel companies had hundreds of men working in defiance of Mr. Lewis who, however, apparently had the backing of most of the delegates at the CIO convention at Detroit.

Two Furnaces Shut Down

Observers recalled that work stoppages and slowdowns in the steel industry, prior to the coal strike, had caused a loss in steel production estimated at 700,000 tons, a loss which will be a burden on civilian steel consumers for all of 1941 and beyond. How quickly this total will increase if the coal strike continues may be judged by the fact that the Clairton, Pa., works of Carnegie-Illinois Steel Corp., "bottleneck" plant on which operations of most U. S. Steel Corp. steel plants in the Pittsburgh area depend, has little more than six days' supply of coal.

6 Days' Stock At Clairton

Since earlier shutdowns have reduced the steel industry's supplies of coal, coke, pig iron, scrap and semi-finished steel, the gravity of the Lewis threat to steel production, to defense and non-defense plants, and to the entire defense program seemed hard to exaggerate.

While the CIO strike threatened the entire output of steel, other difficulties continued to beset steel consumers despite slow progress already made in streamlining the priorities system.

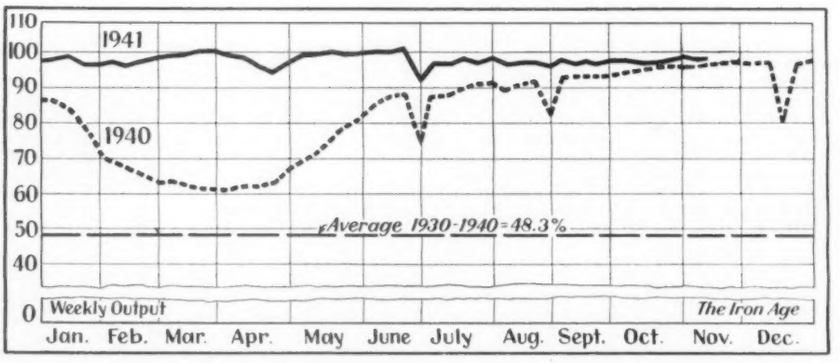
One of the industry's experts on mill operation told THE IRON AGE that only about 60 per cent of the potentially available plate capacity in the country is now being used because of the inefficient allocation of plate orders by Washington. Of all the claims made about defense agency mismanagement, this is one of the most serious since plates have long been one of the scarcest of steel items. Plate allocation has been presented as a successful system which could well be applied, at the proper time, to all steel items and to other materials. Demands that mills stop rolling sheets and strip for the automotive industry and, after conversion, be used to roll vitally-needed plates, have figured in the plate situation of recent months.

To support his claim that allocation of plates is being misdirected and, perhaps, should be handed over to the mills themselves, this rolling mill expert declares that (1) one of the largest plate rolling mills in the country recently was assigned to roll plates that permitted the usage of only 44 per cent of the mill's rolling surface, (2) a mill with a 100-in. capacity has been assigned to roll plate 60 in. wide, forcing it, since the plate length is 96 in., to turn the slabs sideways before entering the mill and involve an abnormal use of its shearing equipment, (3) a mill poorly fitted to produce heavy plate has been told to continue rolling that product al-

40% of Plate Capacity Idle

Steel Ingot Production—Per Cent of Capacity

(Open Hearth, Bessemer and Electric Ingots)



Steel Ingot Production, by Districts—Per Cent of Capacity

	Pitts-burgh	Chi-cago	Val-leys	Phila-delphia	Cleve-land	Buf-falo	Wheel-ing	De-troit	South-ern	S.Ohio River	West-ern	St. Louis	East-ern	Aggre-gate
Current Week	100.0	101.0	96.0	90.0	99.0	90.0	94.0	101.3	95.5	101.0	96.0	111.0	107.0	97.5
Previous Week	99.0	102.0	96.0	90.0*	98.0	92.5	94.0	109.0	95.5	97.0	96.0	111.0	109.0	97.5

* Revised

though it could turn out a much larger tonnage of lighter railroad car plate, (4) some mills are rolling 36-in. plate although equipped to roll material twice as wide.

A move has been started to bring about a complete reallocation of freight and tank car plates so that the mills will go on all-out production for Navy, Maritime Commission and lease-lend use. Pressure may be exerted to bring Navy and Maritime Commission plate specification closer to commercial practice so that output can be increased.

Defense Takes 60% of Steel

This week brought to light an interesting steel industry backlog analysis which shows 60.3 per cent of all steel orders for November delivery are for direct and indirect defense needs. October delivery orders showed 58.6 per cent for defense, while steel orders for delivery after Dec. 1 for steel companies with 94 per cent of the industry's capacity are 57.4 per cent for defense and total 11,207,171 net tons. A chart in the current issue of THE IRON AGE shows that the defense program (for November delivery) is taking steel ranking, by products, from a high point of 100 per cent for armor plate and forgings to a low of 11.4 per cent for tin and terne plate. Ninety-one per cent of the plates for November delivery, or 465,436 tons, were for defense.

This breakdown, prepared with the aid of various steel companies, disposes of some of the theorizing as to the percentage of steel output going to defense. At the same time, it shows how little remains, in some steel items, for distribution among civilian plant consumers, which includes thousands of small plants. If the substantial steel order book tonnage which is anticipatory and above the normal requirements of some buyers could be subtracted from the tonnages shown in this analysis, the percentage of orders for indirect and direct defense would average considerably higher than 60.2 per cent.

Nelson on Metal Pools

How difficult it is to set aside and divide pools of materials such as steel for non-defense plants was described a few weeks ago by Donald M. Nelson, SPAB executive director. Mr. Nelson's reasoning why the setting up of pools cannot be utilized to prevent "priority shutdowns" of small plants follows:

"In the first place the needed quantities of critical materials simply aren't available. I have tried, as earnestly as I know how, to explain that these shortages are desperate. We can't set up any kind of blanket, over-all guarantee for the very good and unavoidable reason that we can't possibly find the necessary materials to do it with.

"In the second place: If you did try to set up such a plan, where would you draw the line? Would you say that the man with 20 employees qualified for aid while the man with 25 did not? A worker will be just as hungry, when the shop closes down, if he is one of 25 workers or 100 or 1000, as he would if he were one of 20. Furthermore, mere size of plant is not the sole criterion; there are many comparatively large plants which cannot be converted to defense production. Are we to plow all of them under and extend our aid only to those plants which are physically and financially tiny?"

Meanwhile, steel ingot production, as the week began, before the coal strike had any direct effect stood at 97.5 per cent, unchanged from last week, according to THE IRON AGE estimate. Continued efforts of OPM in shifting scrap tonnages are permitting several producers who have no inventory to squeeze through from day-to-day on a full schedule. Prior to the coal strike, the Pittsburgh district reported steel operations up a point from a week ago to 100 per cent; Youngstown unchanged at 96 per cent; Philadelphia unchanged at 90 per cent; Cleveland up one point to 99 per cent; Buffalo off 2.5 to 90 per cent; Wheeling unchanged at 94 per cent; Birmingham unchanged at 95.5 per cent; Detroit down 8 to 101 per cent; Southern Ohio River up 4 to 101 per cent; Western unchanged at 96 per cent; St. Louis unchanged at 111 per cent, and Eastern down 2 to 107 per cent. The big Chicago district was down a point to 101.

Steel Output Holds at 97%

Incoming steel orders in November have been from 20 to 30 per cent below the corresponding period of October. The downtrend in bookings is likely to continue with non-defense customers realizing the futility of placing orders on most products. Shipments of bars and barbed wire to Russia have been started. A usually reliable source informs THE IRON AGE that a shipment of British steel was made recently to Trinidad.

Structural steel awards for the week dropped to 13,950 tons from 44,450 tons last week, the largest lettings being 2500 tons at Detroit for a gun turret plant for Briggs Mfg. Co.; 2100 tons for a bridge superstructure at Massillon, Ohio; and 1800 tons for a power house extension at Glen Lyn, Va. New structural projects of 16,700 tons are slightly lower than a week ago and include 2900 tons for the Boston Navy Yard, 2850 tons for an airplane repair shop at Hill Field, Utah, and 1200 tons at Westerly, R. I., for a power house.

Drop in Awards

Reinforcing steel awards total only 2825 tons, while new projects of 21,550 tons include 8000 tons for a shell-loading plant at Wahoo, Neb., 5400 tons for the South Boston Navy Yard, and 3000 tons at Hinton, W. Va., for the Blue Stone Reservoir.

The week was one of "threats" along the labor front. At a number of plants, operating schedules for the current week remained in the "if nothing happens" category. In the Birmingham area, for example, the SWOC local union leaders threatened to shut down Tennessee Coal, Iron & Railroad Co. plants unless union representatives were permitted to hold a "peaceable" membership card inspection. An inspection scheduled for the night of Nov. 17 at the company's Fairfield plant fizzled when county deputy sheriffs kept the roads clear in and about the plant. On the following day units of the Alabama State Guard were called out and held in readiness to keep order.

The steel industry at midweek was awaiting appointment of a new head of the OPM Iron and Steel Branch to succeed A. D. Whiteside, who has resigned. A midwest steel executive has been mentioned for Whiteside's post.



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I'm interested in Pluramelt—send me data.

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News of Industry

• • •

800 Plants Seek Defense Jobs In Pittsburgh Area

By T. C. CAMPBELL



• • • **The effort** to bring more industrial plants into defense production is extending to all parts of the country.

First objective of the new move to spread defense contracts is to increase production of guns, planes, ships and tanks for the defense program but the second objective is equally important.

It is to give defense jobs to the hundreds of plants — large and small—which so far have no defense orders, are consequently unable to get vitally needed material under priorities — and thus face curtailed production or complete shutdowns of their plants.

See table on page 90 for examples of work offered non-defense plants by some of the big companies holding prime defense contracts.

That many of the "civilian product" plants so far have been unable to get defense business, as prime or secondary contractors, was indicated in the recent IRON AGE priorities poll. This survey showed that more than a third of the metal product plants in the United States report operations already affected by priorities and others face early curtailment. (The poll covered 2000 companies).

One of the first stops made by Defense Special trains — three of eight cars each are touring industrial centers — was last week at Pittsburgh where more than 1500 men, representing 800 manu-



ENTERING . .



REGISTERING . .



CONSULTING . .



EXHIBITING . .

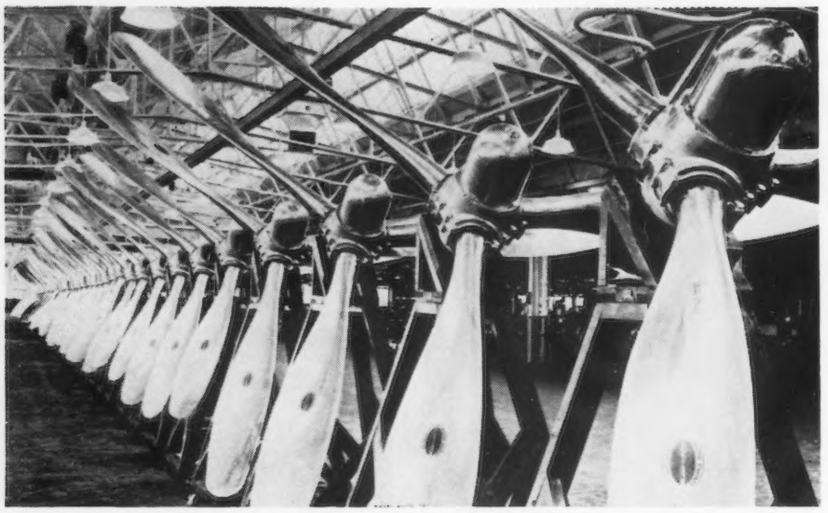


INSPECTING . .



PROBLEMS . .

TRAVELING CONTRACT CLINIC: The above photographs were taken on a Defense Special train at Pittsburgh where 1500 men sought to get or let subcontracts. At the left, second photo from the bottom, is Alex E. Walker, Pittsburgh coordinator, OPM Defense Contract Service, and president, National Supply Co. Scenes like these are being repeated in many industrial centers. *Photos by the IRON AGE*



AIR SCREWS: Three-bladed, hydromatic, controllable pitch propellers of this Hamilton Standard type will be made by Nash-Kelvinator Corp., in one of the former Reo plants at Lansing, Mich., as part of the $100,000,000 worth of defense contracts held by Nash.



RIDE 'EM SOLDIER: Some of the finished Indian motorcycles, made for the Army, being inspected before shipment. A school for Army officers and mechanics is being conducted by the Indian Motorcycle Co. on the maintenance of these machines.



FORD AIRPLANE ENGINES: Production of more than an engine a day, the exact number being restricted information, has been attained by Ford Motor Co.'s airplane engine division. These Pratt & Whitney engines are being packed for shipment at the new aircraft engine unit at the Ford Rouge plant.

facturing companies, participated in two-day conferences to "spread the defense work" in Allegheny County (Workshop of the World) and nearby industrial areas.

The train, carrying samples of needed defense equipment and parts, presented concrete examples, as well as consultation and advice, to determine whether manufacturers, especially the smaller ones, were in a position to complete defense work.

The exhibits at Pittsburgh and elsewhere included gun parts, fuses, bombs, flame throwers, fire extinguishers, propeller parts, other aircraft accessories, pumps, field hospital equipment, cargo ship parts, and hundreds of other defense samples, as well as photographs, blueprints, and detailed specifications of additional items.

Many articles not generally associated with defense such as chairs, harness, saws, and other carpenter tools, pipe-fittings and other normal products, were also displayed.

The Army Ordnance department, Army Air Corps, corps of engineers, signal corps, medical corps, chemical warfare service, quartermaster corps, marine corps, maritime commission, Navy, OPM, and procurement division of the Treasury, were the organizations represented.

From the meetings between defense agency and industrial representatives at Pittsburgh THE IRON AGE obtained the following questions and answers on defense subcontracting:

Contract Questions Frequently Asked

• • • **While literally** thousands of questions are answered daily throughout the country by the Contract Distribution Division of OPM, many of which are specific questions dealing with a particular manufacturer and his problems, the following questions with answers are among the most frequently asked. While some of these have appeared in THE IRON AGE before, they are repeated here for possible information to manufacturers looking for contracts.

Q. What are the main purchasing agencies of the Government for defense?

A. Broadly speaking, defense purchases are made by seven divisions (procurement agencies): (1) War Department; (2) Treasury Department (the largest peace time government buying agency); (3) Navy Department; (4) Marine Corps; (5) Bureau of Ships (Navy); (6) The Bureau of Yards and Docks (Navy); (7) Navy Bureau of Ordnance. The War Department is a decentralized buying agency with seven main branches—Chemical Warfare, Engineer Corps, Medical Department, Ordnance, Quartermaster Corps, Signal Corps and Air Corps—divided into numerour field procurement offices. The Navy Department is a centralized buying agency with a majority of its activities centered in the Bureau of Supplies & Accounts.

Q. How do I get a prime contract?

A. By being able to produce a required article of defense in given quantities, within a limited time, in a manner conforming to specifications, at an acceptable price.

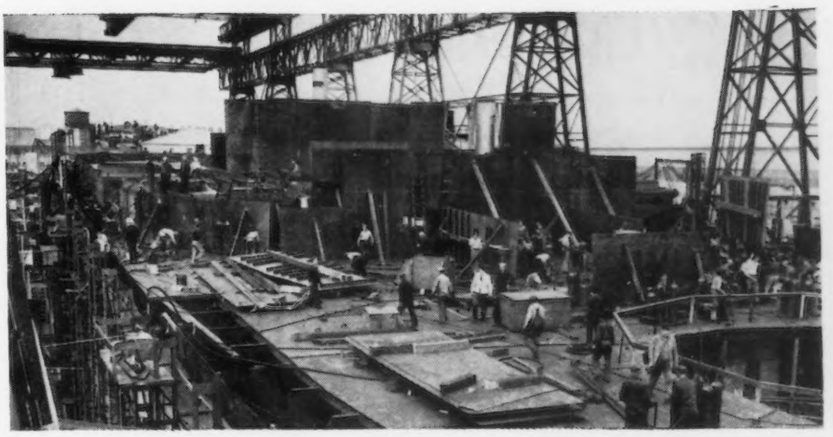
Q. Who is qualified to receive a contract from the government?

A. Contracts are awarded only to manufacturers and regular dealers. A manufacturer is a person who owns, operates or maintains a factory or establishment that produces on the premises the materials, supplies, articles, or equipment requirement under the contract and of the general character described by the specifications. A regular dealer is a person who owns, operates, and maintains a store, warehouse, or other establishment in which the materials, supplies, or equipment of the general character described by the specifications and required under the contract are bought, kept in stock and sold to the public in the usual course of business.

Q. Must I be low bidder to receive a contract?

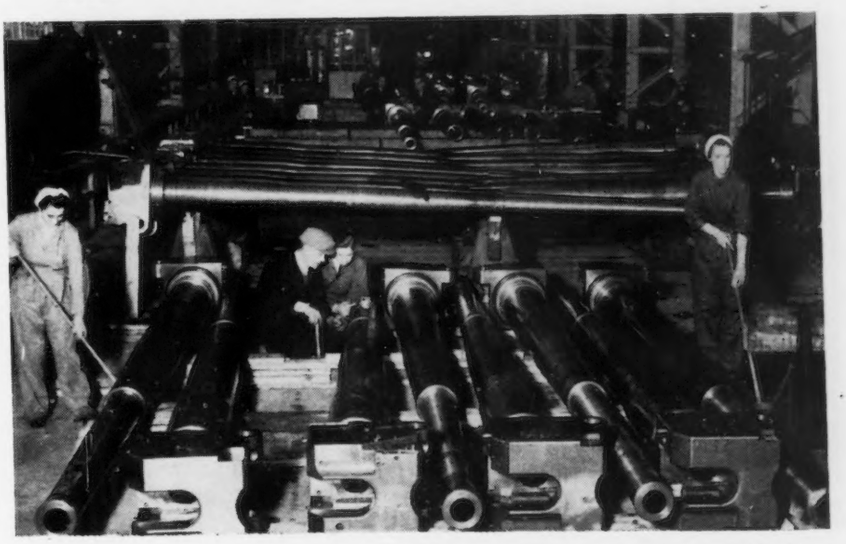
A. No. The law states that "Award is made to the lowest satisfactory bidder." Recent modifications of the above ruling contemplate the award of contracts, under certain conditions, on one of the following bases: (1) A trial order on a cost plus a fixed fee basis. (2) A contract at a price not to exceed 15 per cent above the last price at which a similar article was purchased or 15 per cent above the lowest quotation received. (3) The

(CONTINUED ON PAGE 92)



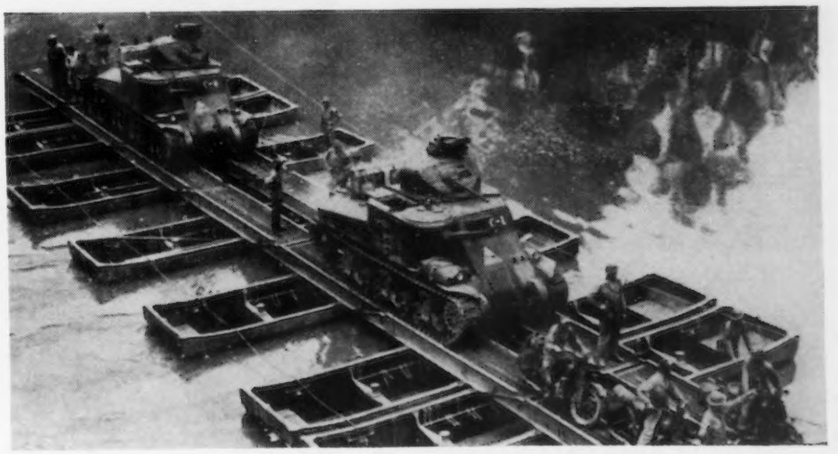
Press Association

RUSH ORDER: Workmen at the Norfolk Navy Yard rush work on the main deck of the new 35,000-ton giant of the U. S. Navy, the battleship U.S.S. Alabama. Props hold the forward superstructure until welding is completed.



British-Combine

WOMEN IN THE WAR: British women are being used more and more in armament plants to meet the shortage of skilled workmen. The women shown here are employed in a naval gun factory in North of England.



International News

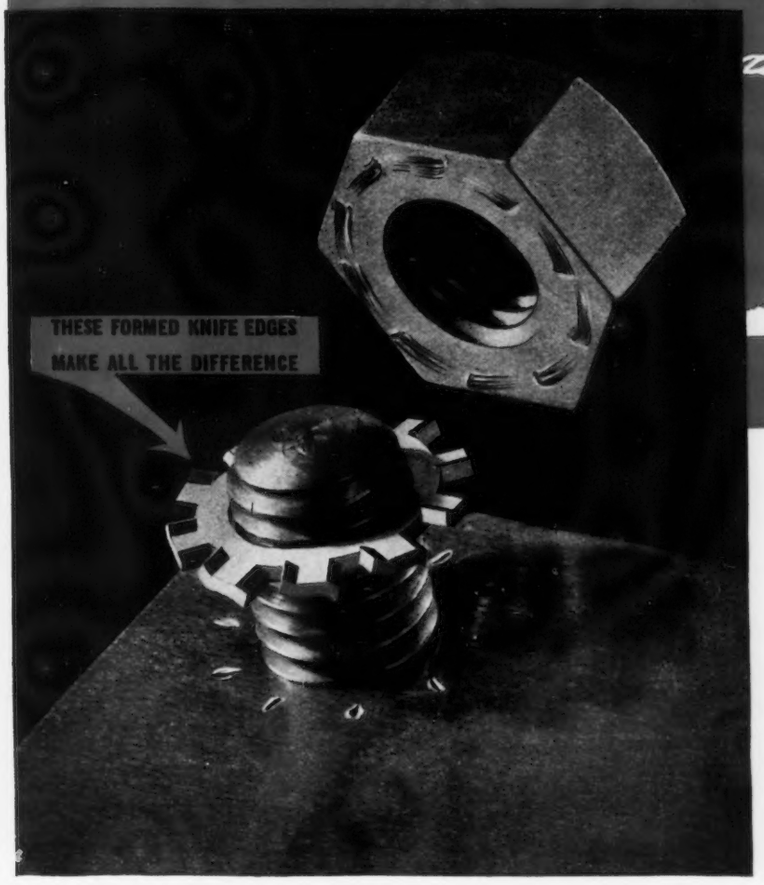
ARMY FERRY: Heavy M-3 tanks are moved across a river on a new type interlocking tread pontoon ferry built by Army engineers during recent exercises in the South. The tank crew and the engineers are part of the first armored division from Fort Knox, Ky.

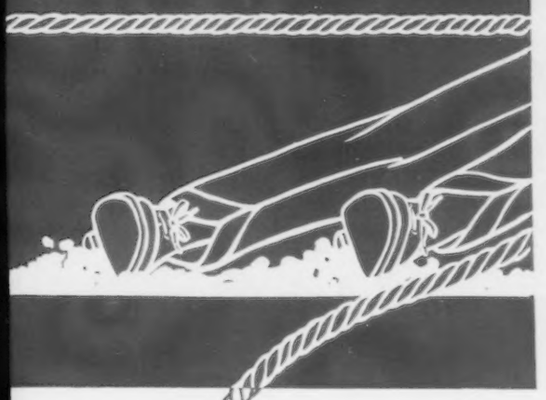
Wanted, Subcontractors By These 13 Companies

• • • (Listed below are a few of the prime contractors seeking to distribute work to non-defense plants at Pittsburgh on a recent 2-day defense clinic, held on an 8-car train. Some of the data needed by subcontractors appear in this table.)

COMPANY	EQUIPMENT REQUIRED	ITEMS TO BE MADE	QUANTITIES	MATERIAL	TOLERANCES	DRAWINGS OBTAINABLE
Bridgeport Thermostat Co., Bridgeport, Conn. A. C. Hill, Purchasing Dept.	Six-spindle automatic screw machines	Cartridge containers o. d. 0.935-in., length 2.3925-in.	100,000 to 500,000 each	WDX 1335		Pittsburgh office of Defense Contract Service
Westinghouse Electric & Mfg. Co. Union Bank Bldg., Pittsburgh L. E. Osborne, Sub-Contract Dept.	Hor. boring mills with 6-in. bar or larger; vert. boring mills, 84-in. or up; milling machines, planers, and radial drills of 5 to 6 ft. required	Motor frames	Large; work will be continuous	Varies		Not available in Pittsburgh office
Blaw-Knox Co., Martins Ferry Division, Martins Ferry, Ohio F. O. Dutton	6-ft. vert. boring mill; 5-ft. radial drill; 6-ft. vert. boring mill; 3-in. hor. boring mill; 72-in. planer, 5-ft. planer; 5-in. hor. boring mill; 5-ft. radial drill; 8-ft. vert. boring mill; 6-ft. radial drill; 10-ft. vert. boring mill; 8-ft. planer; 6-ft. radial drill.	Bofor gun parts	Varies	Steel castings furnished by prime contractors.	Rough machine, 0.003 to 0.005. Finish machine, 0.001 to 0.002	Contact company for further details.
Baldwin Locomotive Works, Philadelphia, R. R. Kiefer, Sub-Contract Dept.	Hor. mills, 5-in. bars; vert. boring mill, 6-ft. and up; planers, 3x3x8 ft., 3½x3½x12 ft.; single and multi-spindle drill presses and radial drills.	Tank parts		Armored steel castings		Contact company for further details
Cannonsburg Steel & Iron Works, Cannonsburg, Pa. L. W. McCandless, Vice-President	Automatic screw machines and light stamping presses	Steel nose plugs	250,000	Steel forgings and sheet copper	0.010 to 0.0025-in.	Pittsburgh office of Defense Contract Service
Mine Safety Appliance Co. Braddock Ave., Pittsburgh Eugene W. Merry	Automatic screw machines up to 2-in.; turret lathes to 2-in., light stamping press.	Gas mask parts	100 to 35,000 each	Bakelite, hard rubber, nickel aluminum, and silver		Pittsburgh office of Defense Contract Service
Savage Arms Co., Utica, New York R. A. Boutillier, Eng. Dept.	Straddle mills; end mills; surface mills; profilers; slotters; drills; surface, internal and external grinders. Tools, jigs, dies, fixtures, gages, cutters, and raw material furnished to sub-contractors.	Parts for .30 cal. machine gun	Lots of 5000 each	Varies	±0.001 to 0.005-in.	Pittsburgh office of Defense Contract Service
Walworth Co. Greensburg, Pa. E. H. Briggs, Manager	Drop forgings, hammers and upsetters	Valve forgings, 2 oz. to 150 lb.				Contact company for further details
Firth-Sterling Steel Co. McKeesport, Pa. George W. Frick	Tool making machines, brazing equipment and tool and cutter grinders.	Carbide form and fluted tools, cutters, counterbores, end mills, dies, etc.			±0.0001 in.	Contact company for further details
McKenna Metal Co. Latrobe, Pa. Alex G. McKenna	Surface and universal grinders, diamond wheels.	Carbide tipped form tools				Contact company for further details
Heppenstall Co. Pittsburgh, H. G. Grim, Sup't.	40-in. blooming mill or larger.	Steel ingots to be rolled	1000 tons per month			Contact company for further details
Parkersburg Rig & Reel Co. Parkersburg, W. Va. H. L. Ruf	Milling, shapers, grinders and case hardening facilities.	Governor weight, governor knife-edge bearing, governor strut, rotor key	650 to 1,660 pieces each	Varies		Pittsburgh office of Defense Contract Service
Elliott Co. Jeannette, Pa. L. M. Forncrook, Vice President	42-in. vert. boring mill with taper attachment; 10-ft. vert. boring mill with taper attachment; 4 to 6-ft. open side planer; 6-ft. radial drill; 30 to 60-in. planers; multi and single spindle drill presses.	Turbo-charger casings, inlet-blower and turbine; blower casings — blower base, turbine casings and exhaust ends, strainer bodies, covers, doors, etc.	1 to 60 pieces	Cast iron and cast steel	±0.002-in.	Contact company for further details
Westinghouse Electric & Mfg. Co. Pittsburgh Group I	Radius planer and grinder up to 18-ft.; high grade tool room equipment, die sinkers, large jig borers, planers, hor. boring mills.	Large segmental lamination dies, die mold for plastics, large jigs and fixtures	1 of each	Tool and machine steel	Some ±0.0001-in. general ±0.001-in.	Contact company for further details
Group II	Hand and auto. screw machines ⅛-in. up to 3¼-in., 97 to 200-ton presses; modern molding and casting facilities.	Screw machine products; molded plastics; 500-lb. to 40,000-lb. gray iron castings; non-ferrous castings ½-lb. to 25 lb.	Various	Iron, steel, brass, aluminum, etc.	±0.005-in. to ±0.001-in. on machined parts	Contact company for further details

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placing of a contract with a responsible defense association or corporation that may be organized from manufacturing establishments of a community or industry to better enable the community or industry to undertake contracts or subcontracts.

Q. How does my firm get on the bidder's list?

A. To get on the Navy bidder's list, apply direct to the Bureau of Supplies and Accounts, Navy Department, Washington, D. C. Army buying is decentralized and the manufacturer must arrange to list his name with each of the procuring agencies throughout the country, with the exception of Ordnance which so far has done no buying outside of its territorial limits.

Q. Where can I find information as to what prime contractors are in need of sub-contract assistance?

A. At your local office of the Division of Contract Distribution. THE IRON AGE and other national trade magazines carry information regarding sub-contract opportunities. In many cities, local newspapers carry daily information regarding prime and sub-contract opportunities.

Q. Are manufacturing "pools" regarded with favor by the government and the prime contractor?

A. Any prime contractor or potential prime contractor may follow the York plan or the Westinghouse plan of increasing productive capacity by utilizing the available facilities (productive) on a one-time contract basis or a continuing contract basis. There are indications of a growing acceptance of the idea of pooling productive facilities not only for the purpose of taking prime contracts but also for the purpose of undertaking subcontracts.

Q. I am now engaged in the manufacture of a particular civilian article. What items can I make for defense purposes and where do I find out about them?

A. First contact your nearest Division of Contract Distribution Office. Bring complete information, if possible, on your productive equipment and present and past line of products. You will be directed to the proper government procurement agency or prime contractor.

Washing Machine Industry Pool Facilities to Make Gun Mounts

• • • **The three prime contractors,** Easy Washing Machine Corp., Syracuse, Apex Electrical Mfg. Corp., Cleveland, and Nineteen Hundred Corp., St. Joseph, Mich., who were recently awarded a 12 million-dollar defense contract for the manufacture of gun mounts, have appointed Wilburt H. Winters, chief defense coordinator. Mr. Winters was formerly vice-president of American Brake Shoe & Foundry Co., New York. Under his supervision the three companies have arranged to pool their personnel into various divisions consisting of inspection, purchasing and planning, accounting and sub-contracts and tool design and production.

The Easy Washing Machine Corp. has been assigned the responsibility for the entire tooling program to manufacture this mount. Elmer C. Cooley, chief tool design engineer of the Easy Washing Machine Corp., and for the washing machine industry, will be in charge .

At a meeting of companies of the industry held in Chicago on Nov. 4, it was announced to the various representatives present that the policy of the prime contractors would be to spread the work and sub-contract to as many of the 34 washing machine manufacturers in the industry as are willing to participate.

Ohio Crankshaft Co. Marks Anniversary

• • • **The 21st anniversary** of the Ohio Crankshaft Co. of Cleveland was celebrated Tuesday, Nov. 18, by a luncheon and the first official inspection of the company's new $4,500,000 subsidiary defense plant, Ohio Crankshaft, Inc., which is producing crankshafts for Wright 14-cylinder Cyclone motors. It is Cleveland's first major defense plant.



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The Gusher starts delivery when you flip the switch—no priming. A small trickle or a big flow to suit your needs. Maintenance is something you can forget because this pump has no packing, and grit particles cannot harm it.

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● The great production demands now being made on plants and shops make "practical engineering service" on cold finished steel bars extremely valuable. Such service, as developed and practiced by La Salle for many years, has meant many things:

It has meant going into a plant and helping the buyer determine the one right steel for every job.

It has meant working understandingly with machine tool operators to get more production out of present equipment.

It has meant going into a huddle over parts blue-prints to weed out obsolete steel bar grades and to recommend newer, more efficient analyses.

It has meant briefly, making available all the accumulated background and experience of years of working with cold finished steel bar users.

Such "practical engineering service" now is paying dividends in hundreds of plants where La Salle recommendations are helping management meet defense-quickened schedules. It is one of the many reasons why La Salle today stands high on purchasing agents' lists of suppliers. It explains one of the reasons why La Salle will *stay* at the top of the list for hundreds of cold finished steel bar users for years to come.

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★ *Advanced Research*
★ *Practical Metallurgy*

La Salle STEEL

IN THE MIDWEST
IT'S *La Salle*

Reduction in Traffic Delay Through

CENTRAL LOCATION



An important factor in La Salle's acceptance as the "top" source of supply by many steel bar users is its central location. The La Salle plant at Hammond, Indiana is directly served by three railroads and a main trunk highway. This reduces to a minimum the possibilities of delay in shipments due to inadequate transportation facilities.

Time and Money Saved by

"MOST COMPLETE LINE"



The economy, convenience and safety of having a source that is equipped to give service on a *complete* line of products rather than on only a portion of a users's requirements is seldom overlooked by buyers of cold finished steel bars. La Salle produces "The Most Complete Line of Cold Finished Steel Bars in America."

Faster Production, Lower Costs Through

ADVANCED RESEARCH



Faster cutting, better, lower cost materials for steel users is the purpose of La Salle's research which never stops. Experienced metallurgists are unceasingly searching for new improved steels to add to those developed in the past: 1020-90, Silver Tip, Gold Tip, Tritex, Tuftork and STRESSPROOF. Another factor which makes La Salle "stay at the top of the list"!

Cash in on La Salle's

FORESIGHT



"Yesterday's Foresight Meets Today's Demands" is the basic policy of La Salle's continuous effort to serve users better and better. Expanded facilities, improved methods of operation and better and better steels are the result—results that pay dividends to users who think of La Salle as their main source of supply for cold finished steel bars.

Trends Toward Tighter Control on Steel Continue

Pittsburgh

• • • **Steel industry market news** is highlighted this week by trends toward tighter control over distribution of all steel products needed for national defense. While all products will not immediately become part of an allocation set-up, at least those on which deliveries for defense are behind are slated for quick treatment.

Steel plates will be the guinea pig in the initial stages of the all-out allocation program. Pressure will be terrific in coming weeks backed up by outright OPM allocation orders in an attempt to have all specific plate mills supersede all rollings with Maritime, Navy, and lend-lease requirements. Other high priority rated plate tonnage involving car and tank plates is expected to be reallocated to other types of mills such as wide continuous strip mills.

Difficulties ahead will be available shearing equipment for such highly specified material as is ordered by the Navy and Maritime Commission. Rolling mills are capable of producing more plate tonnage than can logically be handled by the finishing end, hence plate capacity figures do not tell the whole story.

Navy, Maritime and OPM officials claim delayed plate deliveries are running as much as several hundred thousand tons, while some steel officials counter with the statement that some of the rush work is placed upon them after rolling mill schedules have been laboriously set up. All this points to stricter control and exploration of reallocations.

Reports persist that munition steel requirements, beginning about the first of the year, will run as much as 200,000 to 250,000 tons a month and that this tonnage will be strictly allocated among various steel mills with instructions to get production out at any cost.

Concrete reinforcing bars have been more or less on an allocation basis. With the production of this product dependent upon available billet stock and with total production almost entirely taken up by priority business, strict allocation by the all-out method is looked for shortly. The same situation, it is said, applies to tool and alloy steels. In other words, these products which had been furnished on priorities will soon be supplied by whomever OPM experts believe can produce and get the material most quickly.

Fresh steel orders so far this month are slightly below October tonnage but are still sufficient to practically match production and shipments. Backlogs are still large and if tin plate requirements are added to direct and indirect defense tonnage, current shipments for defense purposes are running between 70 and 75 per cent, and that this figure will be higher within the next month.

Whiteside Successor To Be Appointed Soon

Washington

• • • **Announcement is expected shortly of a successor to A. D. Whiteside who has resigned as Chief of the OPM Iron and Steel Branch, effective Dec. 1. Mr. Whiteside will resume his private duties as a member of Dun & Bradstreet, New York.**

Pittsburgh Steel Co. Nets $687,536 in Quarter

Pittsburgh

• • • **Pittsburgh Steel Co.** reports net profit, for the quarter ended Sept. 30, of $687,536. Net profit for the first nine months of this year is $2,366,395.

Pittsburgh

• • • **Follansbee Steel Corp.** and subsidiaries report earnings for the nine months ended Sept. 30 of $321,138 after depreciation, interest, and provision of $169,000 for Federal income and excess profits taxes, equal to $1.03 a share on the outstanding common stock. Sales for the nine months totalled $10,771,646. Gross profit on sales was $820,280.

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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

Magnitude of Defense Task Causes Move Toward Allocations to Crawl

• • • **Development of** allocation programs to supplant the present priority system is making progress slowly. The allocation program is, as Stanley Adams, assistant chief of the Division of Allocations described it, in the crawling stage at present. OPM is endeavoring to push its industry-by-industry survey of material needs as rapidly as possible, but the magnitude of the task precludes any overnight results. Some industry committees, which have already been formed, are already tackling the problem of its particular industry needs.

Better understanding of the ground work which must be laid before allocations can be used is reducing industry fears of the consequences of a too-sudden changeover from priorities. Meanwhile, defense officials have warned, industry must be guided by preference orders, as in the past.

Chief activity in priorities in the past week was the refining of preference orders already in effect. Magnesium, methyl alcohol and research laboratory supplies were among the items affected by such moves. Elevators, conveying equipment, wooden containers and steel drums were among the new products given the assistance of priorities in the past week to obtain needed supplies.

A new type of order made an appearance in the past week, an order called "A Special Allocation Order." The first of this type was directed to certain machine tool makers instructing them to accept specified orders from Amtorg Trading Corp. which is acting for the Russian government.

On the price front, chief interest was in the gradual, but definite movement of OPA into the retail price field, as highlighted by the issuance last week of a maximum price schedule covering builders' hardware and insect screen cloth. It is expected that similar action will be taken shortly on copper products. In addition to hardware, a formal price schedule was also issued covering steel castings. Drop forging makers were requested not to raise prices.

Prospect of inclusion of a licensing system in the price bill now pending in Congress grew stronger last week on the action of several administration leaders in appealing to the Banking Committee, which is now considering the price measure, to restore such provisions. The licensing proposals were originally eliminated by the Banking Committee.

Details of developments in prices and priorities last week follow:

Drop Forgings

• • • **Indications** that further advances were in prospect were assigned as the reason OPA last week requested producers of drop forgings made of steel and steel alloys not to exceed prices that prevailed on Oct. 10. OPA said that many drop forging manufacturers are booked to capacity with defense work for months ahead. The general level of prices, it was added, has shown a substantial increase thus far in 1941.

Steel Castings

• • • **Effective Nov. 15,** OPA froze prices for carbon and low-alloy steel castings, including railroad specialties, at levels prevailing on July 15. Except for railroad specialties, Price Administrator Henderson said, these maximum prices will approximate those contained in "Comprehensive Report of Price Lists of Miscellaneous Castings" issued by the Steel Founders' Society of America for the third quarter of 1941. Any miscellaneous castings for which prices are not determined in this report also are to sell at not more than the July 15 levels. Special provision is made for pricing of castings not previously produced by a manufacturer. Data on such castings, when part of an order totaling $100 or more must be filed with OPA along with the proposed maximum selling price. Steel castings are described as any cast steel object which contains less than 1.70 per cent carbon and, or, alloys totaling not more than 8 per cent.

Builders' Hardware

• • • **Manufacturers' and** jobbers' prices of a wide variety of builders' hardware items have been stabilized at the levels prevailing on October 21 in a maximum price schedule issued last week by the Office of Price Administration. Prices of insect screen cloth, which is distributed through the same channels as builders' hardware, also are held to their October 21 levels by the OPA ceiling, which becomes effective November 19.

The new schedule covers eight types of knobs and handles, 20 types of door locks, 13 types of hinges, 16 items of miscellaneous door hardware, 10 items of window hardware, five of screen hardware, and 12 miscellaneous articles, such as house numbers, transom chains and snap catches. Painted, galvanized, commercial bronze, hand-drawn copper and "koolshade" fabric window screen cloth are included.

Retailers have been exempted from the schedule in the belief that they also will apply the October 21 level to their price lists. According to the schedule's definition, a "retailer" means a person who maintains a store where 75 per cent of the dollar volume of all products, whether or not covered by the ceiling, represented sales without discount, except cash discount, from his regular retail prices in the six months preceding November 19.

The maximum price for any article included in the schedule shall be determined as follows:

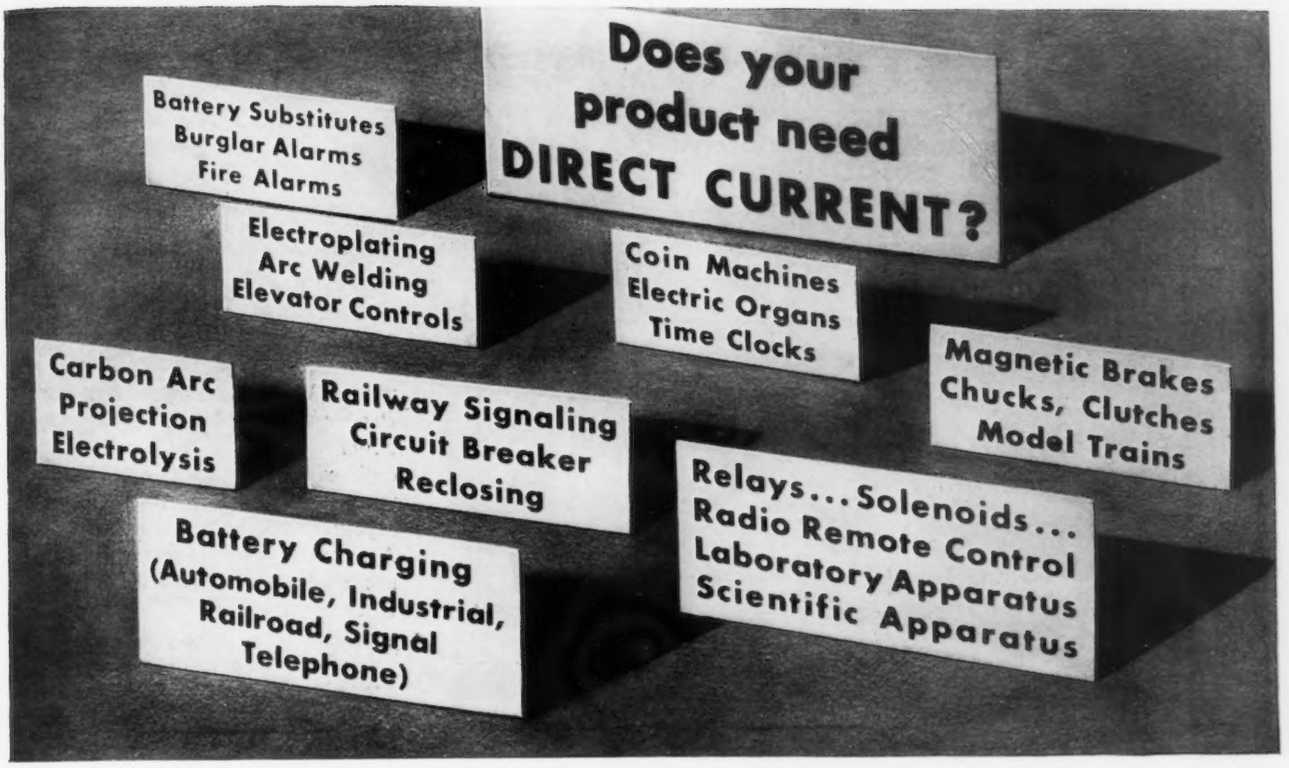
(1) It shall not exceed the highest price at which a similar item was sold during the period between Sept. 22 and Oct. 21, 1941, to the same purchaser.

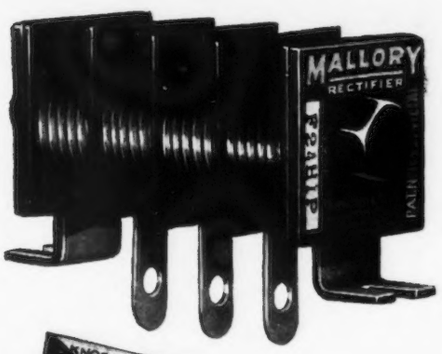
(2) If no sale to the "same purchaser" was made during such period, the top price shall be that charged a purchaser of the same class.

(3) If no sale of a similar article was made between Sept. 22 and Oct. 21, the ceiling price shall be determined from the price of a related item.

(4) In all other cases, the maximum price shall be the market price.

A record of selling prices dur-





Many times it is possible to simplify mechanisms, cut costs and improve reliability of operation by the use of direct current for control or power circuits, or electrically operated equipment.

And many D.C. power applications may be made more reliable, more efficient and more compact if available A.C. power is converted to D.C.

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P. R. MALLORY & CO., Inc., INDIANAPOLIS, INDIANA *Cable Address*—**PELMALLO**



ing the Sept. 22-Oct. 21 period must be available within 30 days for the inspection of OPA. Similar sales records for each month beginning with November must also be kept. OPA may require the submission of such reports as may from time to time be considered necessary.

Steel Drums

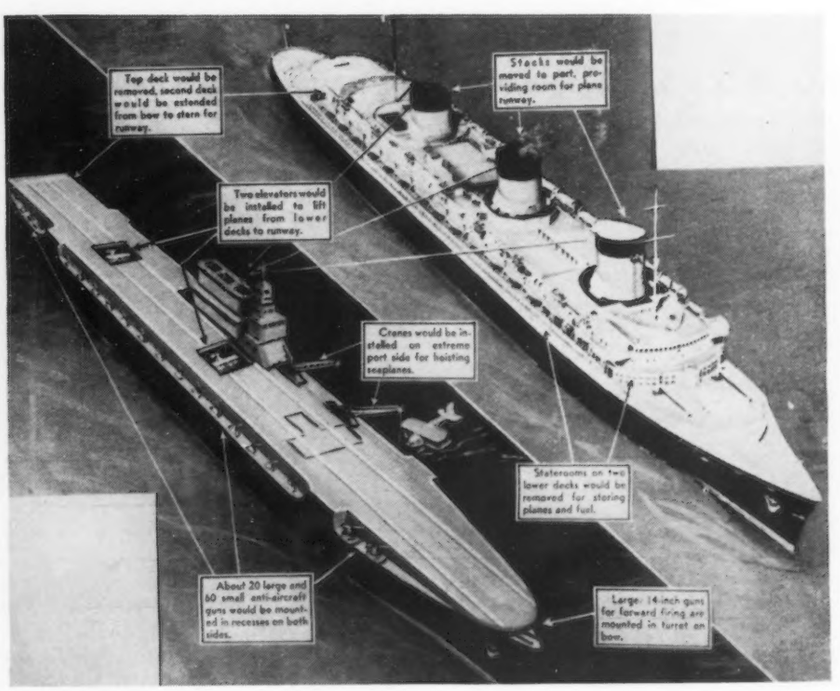
• • • **Effective immediately,** the OPM Priorities Division on Monday announced two orders designed to make possible the speedy manufacture of steel drums.

To be used only upon specific order of the Director of Priorities, General Preference Order M-45 requires manufacturers of steel drums to set aside a specified inventory of 16 and 18 gage-hot-rolled sheet steel from which drums are made. With this order was issued Preference Rating Order P-76 which extends a rating of A-4 to deliveries of the sheet steel to drum manufacturers for the purpose of replenishing the original inventory. A manufacturer is not required to set aside more than the original reserve inventory, it was pointed out, and he is not required to replace it. If he wishes to do so, however, the Priorities Division said, he can use the preference rating extended by Preference Rating Order P-76 to acquire the necessary stock.



Photos by International and British-Combine

ONE DOWN, ONE UP: The Ark Royal (top) British aircraft carrier frequently reported sunk by the Germans, last week did sink following an attack by a Nazi U-boat. It was one of the newest of Britain's plane carriers. In New York harbor is the huge French liner, Normandie, (bottom), which could be converted into an aircraft carrier in six months at a cost estimated at $5 to $8 millions.



Wooden Containers

• • • **An A-5 rating** has been assigned to the deliveries of all ferrous material necessary for the manufacture of paperboard containers, barrels, kegs, and other wooden containers, except wire, which was rated A-8, in Preference Rating Order 79, issued last Friday by OPM. The necessary hardware includes nails, saws, knives, and other tools, but quantities and kinds of ferrous materials to which the rating use is limited are set forth in PD-82.

PD-73

• • • **The OPM** Iron and Steel Branch has issued a warning to steel purchasers that deliveries will be delayed if Form PD-73 does not accompany orders to producers. The Iron and Steel Branch said that a number of shipments are being held up because of failure to file this form.

Financing Arranged

• • • **A DFC agreement** for $6,615,761 in federal funds for additional plant facilities has been announced with Extruded Metals Defense Corp. of Grand Rapids, Mich.

Revision for The Iron Age Priorities Guide

• • • Following revisions should be made to THE IRON AGE Priorities Guide No. 2 which appeared in the issue of Oct. 23 to keep the Guide up to date.

Under "P Orders," pages 2 and 3, add the following:

P-62 — Scarce material for research laboratories. (10-15)

P-76—Steel sheets for drums. ((11-17)

P-79 — Hardware supplies for cooperage and wooden container industry. (10-14)

Under "M Orders," page 4, add:

M-2-b—Directs distribution of magnesium and magnesium products, including scrap, discarded products, etc. (10-14)

M-31 — Amendment: Order of shipments for specified uses. (10-12)

M-45—Sheet steel inventory for drums. (11-17)

Under "L Orders" add:

L-4-a—Restricts output of light trucks for civilian use in January. (10-14)

L-11—Restricts use of chlorine in paper, pulp and paperboard making. (10-15)

Under "Miscellaneous Orders" add:

Special Allocation Order No. 1 —Directs acceptance of specified machine tool orders placed for account of Russian Government. (10-11)

Under "OPA Price Schedules," page 7, add:

No. 40—Builders' hardware and insect screen cloth. (10-14)

No. 41—Carbon and low-alloy steel castings, including railroad specialties. (10-14)

Under "Forms to Use With Priority Orders," pages 6 and 7, add:

PD-133 — Certificate of compliance with Order L-8.

PD-152 — Report concerning cobalt, re Order M-39.

PD-153 — Report concerning cobalt, re Order M-39.

PD-157—Report of rebuilt machine tools, re Order P-77.

Under "Index to Material and Equipment," pages 1 and 2: insert following in proper alphabetical order.

Research activities—P-62.

Hardware supplies — P-79, PS-40.

Castings, steel—PS-41.

Cooperage industry—P-79.

Machine tools — Special allocation Order No. 1.

Magnesium—M-2-b.

Trucks—L-4-a.

Chlorine—L-11.

Drums—P-76, M-45.

Paper, paperboard, and pulp—L-11.

THIS WEEK'S Priorities and Prices

Machine tool rebuilders granted preference rating of A-1-c for acquiring scarce materials in Order P-77 issued Nov. 10. (OPM:PM1531)

Elevator and escalator makers given preference rating of A-3 for critical materials to be used for maintenance and repair of existing installations in Order P-72 issued Nov. 11. (OPM:PM1450)

Conveying machinery and equipment manufacture covered by preference rating of A-3 in Order P-78 issued Nov. 10. (OPM:PM1540)

Phenols placed under full priority control in Order M-27 issued Nov. 10. Complete allocation of production is provided by the order. (OPM:PM1538)

Electric power curtailment for the Southeastern area postponed for a week. Possibility seen of permanent postponement for some areas and 5 per cent curtailment for others. (OPM:PM1522)

OPM requested to obtain detailed production programs, industry by industry, for 1942 to lay foundation for allocation programs. (SPAB:SPA14)

Crude oil refiners, producers and marketers requested to refrain from advancing crude prices over level of Oct. 1. (OPA:PM1528)

Copper users facing hardship under workings of copper conservation order M-9-c provided with special appeal form, PD-167, for presenting their cases. (OPM:T45)

Drop forgings makers requested not to raise prices above Oct. 10 level.

Repair Order P-22 amended to include other industries; revisions made in terminology of several sections of order. (OPM:PM1539)

Magnesium control tightened in Order M-2-b issued Nov. 14. Aim is to move stocks in form of scrap, finished and semi-finished and discarded products into direct defense channels. (OPM:PM1564)

Light trucks made for civilian use to be curtailed 35.9 per cent in January, according to Order L-4-a issued Nov. 14. (OPM:PM1576)

Electric power consumption of large commercial and industrial users in the Southeast restricted to amount used in base month fixed in original limitation order (L-16). Proposed 30 per cent cut for such users deferred until Dec. 1. (OPM:PM1581)

Research laboratories granted preference rating of A-5 in Order P-62 issued Nov. 15. Order broadens assistance given by Order P-43. (OPM:PM1563)

Chlorine use in pulp, paper and paperboard use ordered reduced in Order L-11 issued Nov. 15. (OPM:PM1590)

Cooperage and wooden container industry given preference ratings of A-5 and A-8 to assist in obtaining needed hardware supplies in Order P-79 issued Nov. 14. (OPM:PM1587)

Machine tool makers instructed to accept specified orders placed by Amtorg Mfg. Corp., representing the Russian government, in Special Allocation Order No. 1. (OPM:PM1559)

Methyl alcohol subjected to additional controls in amendment to Order M-31 issued Nov. 12. (OPM:PM1541)

Oil burners may be used in defense housing construction on the Eastern seaboard according to an amendment to Defense Housing Critical List issued Nov. 13. (OPM:PM1572)

Copper wire and cable makers meet with OPA to consider a price schedule. Preparation on schedule reported being speeded. (OPA: PM1594)

Steel casting price ceiling established in schedule No. 41 issued Nov. 14. Schedule covers carbon and low-allow castings and railroad specialties. (OPA:PM1588)

Builders' hardware and insect screen cloth prices stabilized at levels prevailing Oct. 21 in price Schedule No. 40 issued Nov. 14. Schedule covers manufacturers' and jobbers' prices of wide variety of items. (OPA:PM1579)

Steel drum making to be expedited by two orders, M-45 and P-76, both issued Nov. 17. Order M-45 instructs steel drum makers to set aside an inventory of sheet steel for drums, while order P-76 grants a rating of A-4 for the acquisition of such steel. (OPM: PM1591)

New Iron and Steel Sc

← Dealers — Producers →

PD-151 (This form may be obtained from the Bureau of Mines, Pittsburgh, Pa., or may be reproduced. Use exact form and size.) CONFIDENTIAL (For use of Federal Defense Agencies only)

FOR NATIONAL DEFENSE PLEASE RUSH!

OFFICE OF PRODUCTION MANAGEMENT
IRON AND STEEL BRANCH
SOCIAL SECURITY BUILDING
WASHINGTON, D. C.

DEALERS' AND BROKERS' REPORT OF STOCKS, RECEIPTS AND SHIPMENTS OF IRON AND STEEL SCRAP FOR THE MONTH OF OCTOBER 1941

NAME OF DEALER OR BROKER

ADDRESS

This form is prescribed pursuant to General Preference Order M-24. Two copies must be filed not later than the 20th of November with the BUREAU OF MINES, PITTSBURGH, PA., not with the Office of Production Management.
Before filling in this form, see the last sheet for instructions. All figures must be in Gross Tons. Report each yard or dismantling project separately

1. Location of Yard or Dismantling Project: .....

2. Stocks and Shipments During October:

GRADES OF SCRAP	Stocks on Hand September 30 [1] (Gross tons)	Shipped During October		Stocks on Hand October 31		Scrap Due October 31 [4] (Gross tons)
		To Consumers [2] (Gross tons)	To Others [3] (Gross tons)	Sold (Gross tons)	Unsold (Gross tons)	
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7
No. 1 Heavy melting						
No. 2 Heavy melting						
Bundles						
Low phos scrap						
Cast scrap						
Turnings and/or borings						
Rerolling rails						
Scrap rails						
Chromium-nickel stainless steel						
Chromium base stainless steel						
All compositions of SAE low alloy steels						
All other prepared scrap						
Unprepared scrap						
TOTAL SCRAP (all grades)						

[1] Include all stocks actually in your yards or dismantling projects, whether sold or not.
[2] Include only shipments invoiced by you to consumer.
[3] Include shipments invoiced by you to other brokers or dealers.
[4] Include all scrap purchased or otherwise acquired at any time but not delivered to you by October 31.

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3. Purchases during October:

NAME AND ADDRESS OF SUPPLIER (Do not list peddlers separately. For purchases from peddlers, enter in this column "From Peddlers" using a separate line for the total of each grade purchased from peddlers.)	Grade [1]	TONNAGE PURCHASED DURING OCTOBER (Gross Tons)	TONNAGE DUE OCTOBER 31 [2] (Gross Tons)	NAME AND ADDRESS OF CONSIGNEE (All purchases coming to your yard should be included. In such cases enter "Own yard" in this column)
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5

[1] For definition of peddler, see Instructions, back of next page.
[2] In column 2 enter each grade separately, using grades as listed in the Office of Price Administration's Price Schedule No. 4, showing each unprepared and superior or inferior grade separately. For railroad scrap, give grade of scrap and name of railroad from which scrap originated.
[3] In column 4 include tonnage purchased previously but not received by October 31.

16—34419-1

4. Sales during October:

NAME AND ADDRESS OF CUSTOMER	Grade [1]	TONNAGE SOLD DURING OCTOBER (Gross Tons)	TONNAGE OWED OCTOBER 31 [2] (Gross Tons)	NAME AND ADDRESS OF CONSIGNEE
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5

[1] In Column 2 enter each grade separately, using grades as listed in the Office of Price Administration's Price Schedule No. 4, showing each unprepared and superior or inferior grade separately. For railroad scrap, give grade of scrap and name of railroad from which the scrap originated.
[2] In Column 4 include tonnage sold previously but not shipped by October 31.

INSTRUCTIONS FOR FILLING IN FORM PD-151

Number of Copies.—Prepare 3 copies of this form and forward the original and second copy directly to the BUREAU OF MINES, PITTSBURGH, PA. The third copy is to be kept for your own files. Do not send any copies to the Office of Production Management. A separate form should be made out for each yard or dismantling project.

When to File.—This form must be filed with the BUREAU OF MINES, PITTSBURGH, PA., not later than the 20th of November.

Who Should File.—Every person who is a broker or dealer in iron or steel scrap must report on this form. Peddlers are not to file a report. A peddler is a person who collects scrap with a vehicle and does not own or operate a yard.

Section 35 (A) of the United States Criminal Code, 18 U. S. C. A. 80, makes it a criminal offense to make a false statement or representation to any Department or Agency of the United States as to any matter within the jurisdiction of any Department or Agency in the United States.

The undersigned certifies that he executed the above statement on behalf of and by the authority of the company filing this report, and that the information contained in this report, is correct and complete to the best of his knowledge and belief.

Prepared by .....
(Name of official)

.....
(Date) (Title)

U. S. GOVERNMENT PRINTING OFFICE 16—34419-1

PD-149 (This form may be obtained from the Bureau of Mines, Pittsburgh, Pa., or may be reproduced. Use exact form and size.) CONFIDENTIAL (For use of Federal Defense Agencies only)

FOR NATIONAL DEFENSE PLEASE RUSH!

OFFICE OF PRODUCTION MANAGEMENT
IRON AND STEEL BRANCH
SOCIAL SECURITY BUILDING
WASHINGTON, D. C

PRODUCERS' REPORT OF STOCKS, PRODUCTION AND SHIPMENTS OF IRON AND STEEL SCRAP FOR THE MONTH OF OCTOBER 1941

NAME OF PRODUCER

ADDRESS

This form is prescribed pursuant to General Preference Order M-24. Two copies must be filed not later than the 20th of November with the BUREAU OF MINES, PITTSBURGH, PA., not with the Office of Production Management.
Before filling in this form, see the reverse side for instructions. All figures must be in Gross Tons. Report each plant or place of scrap production separately.

1. Location of plant (or place) covered by this report: .....

2. Stocks and Shipments During October

GRADES OF SCRAP	STOCKS ON HAND SEPTEMBER 30 [1] (Gross tons)	SHIPPED DURING OCTOBER —		STOCKS ON HAND OCTOBER 31		ESTIMATED SCRAP PRODUCTION DURING NOVEMBER (Gross tons)	ESTIMATED SCRAP PRODUCTION DURING DECEMBER (Gross tons)
		To Consumers [2] (Gross tons)	To Others [3] (Gross tons)	Sold (Gross tons)	Unsold (Gross tons)		
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8
No. 1 heavy melting							
No. 2 heavy melting							
Bundles							
Low phos scrap							
Cast scrap							
Turnings and/or borings							
Rerolling rails							
Scrap rails							
Chromium-nickel stainless steel							
Chromium base stainless steel							
All compositions of SAE low alloy steels							
All other prepared scrap							
Unprepared scrap							
TOTAL SCRAP (All grades)							

[1] Include all stocks actually on hand, whether sold or not.
[2] Include only shipments of scrap invoiced by you to consumers.
[3] Include shipments of scrap invoiced by you to dealers or brokers.

(OVER) 16—34419-1

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3. Sales and Shipments During October:

NAME AND ADDRESS OF CUSTOMER	Grade [1]	TONNAGE SOLD DURING OCTOBER (Gross tons)	TONNAGE SHIPPED DURING OCTOBER (Gross tons)	TONNAGE OWED OCTOBER 31 [2] (Gross tons)	NAME AND ADDRESS OF CONSIGNEE
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6

[1] In column 2 enter each grade separately, using grades as listed in the Office of Price Administration's Price Schedule No. 4, showing each unprepared and superior or inferior grade separately. For railroad scrap, give grade of scrap and name of railroad from which the scrap originated.
[2] In column 5 include tonnage sold previously but not shipped by October 31.

INSTRUCTIONS FOR FILLING IN FORM PD-149

Number of copies.—Prepare three copies of this form and forward original and second copy directly to the BUREAU OF MINES, PITTSBURGH, PA. The third copy is to be kept for your own files. Do not send any copies to the Office of Production Management. A separate form should be made out for each plant or place of scrap production.

When to file.—This form must be filed with the Bureau of Mines, Pittsburgh, Pa., not later than the 20th of November.

Who should file.—Form PD-149 must be filed for each plant or location which produced 50 gross tons or more of iron or steel scrap in October, unless the plant is also a consumer of scrap, in which case the report for this plant should be made on Form PD-150 instead of this form.

Section 35 (A) of the United States Criminal Code, 18 U. S. C. A. 80, makes it a criminal offense to make a false statement or representation to any Department or Agency of the United States as to any matter within the jurisdiction of any Department or Agency in the United States.

The undersigned certifies that he executed the above statement on behalf of and by the authority of the company filing this report, and that the information contained in this report, is correct and complete to the best of his knowledge and belief.

Prepared by .....
(Name of official)

.....
(Date) (Title)

U. S. GOVERNMENT PRINTING OFFICE 16—34419-1

Scrap Forms For:

Consumers →

↓

PD-150

(This form may be obtained from the Bureau of Mines Pittsburgh, Pa., or may be reproduced. Use exact form and size)

FOR NATIONAL DEFENSE PLEASE RUSH!

OFFICE OF PRODUCTION MANAGEMENT
IRON AND STEEL BRANCH
SOCIAL SECURITY BUILDING
WASHINGTON, D. C.

CONFIDENTIAL
(For use of Federal Defense Agencies only)

CONSUMERS' REPORT OF STOCKS, CONSUMPTION AND PRODUCTION OF IRON AND STEEL SCRAP FOR THE MONTH OF OCTOBER 1941

NAME OF CONSUMER

ADDRESS

This form is prescribed pursuant to General Preference Order M-24. Three copies must be filed not later than the 20th of November with the BUREAU OF MINES, PITTSBURGH, PA., not with the Office of Production Management.
Before filling in this form, see the last page for instructions. All figures must be in Gross Tons. Prepare a single report covering all plants located in the same city. Prepare a separate report for plants located in different cities.

1. Location of plant .....

2. Scrap and Pig Iron Used During October by Type of Equipment:

TYPE OF EQUIPMENT	HOME SCRAP USED DURING OCTOBER (Gross tons)	PURCHASED SCRAP USED DURING OCTOBER (Gross tons)	TOTAL SCRAP USED DURING OCTOBER (Gross tons)	PIG IRON USED DURING OCTOBER (Include Molten Metal) (Gross tons)
Col. 1	Col. 2	Col. 3	Col. 4	Col. 5
Bessemer converters				
Open hearth furnaces				
Electric furnaces				
Cupola furnaces				
Air furnaces				
Blast furnaces				XXXXXXXXX
Other furnaces (specify):				
TOTAL				

3. Production During October by Cupola and Air Furnaces:

	HOME SCRAP (Gross tons)	CASTINGS (Gross tons)
Cupola furnaces		
Air furnaces		

(OVER)

16—24200-1

6. As of October 31, state percent of your unfilled orders and commitments which had priority rating of A-10 or higher .....%.

7. Purchases during October:

NAME AND ADDRESS OF SUPPLIER	GRADE[1]	SCRAP RECEIVED DURING OCTOBER				TONNAGE PURCHASED DURING OCTOBER (Gross tons)	TONNAGE DUE OCTOBER 31[4] (Gross tons)
		Gross Tons	PRICE PAID		Brokerage Fee Paid		
			Delivered[2]	At Shipping Point[3]			

[1] Enter each grade separately as listed in the Office of Price Administration's Price Schedule No. 4, showing each unprepared and superior or inferior grade separately. For railroad scrap, give grade of scrap and name of railroad from which the scrap originated.
[2] Exclude brokerage fee.
[3] For remote scrap only, excluding brokerage fee.
[4] Purchased previously but not received by October 31.

INSTRUCTIONS FOR FILLING IN PD-150

Number of Copies.—Prepare four copies of this form and forward the original and two copies directly to the BUREAU OF MINES, PITTSBURGH, PA. The fourth copy is to be kept for your own files. Do not send any copies to the Office of Production Management. Prepare a single report covering all plants located in the same city. Prepare a separate report for plants located in different cities.

When to File.—This form must be filed with the BUREAU OF MINES, PITTSBURGH, PA., not later than the 20th of November.

Who Should File.—Every person who is a consumer of iron and steel scrap must report on this form.

Section 35 (A) of the United States Criminal Code, 18 U. S. C. A. 80, makes it a criminal offense to make a false statement or representation to any Department or Agency of the United States as to any matter within the jurisdiction of any Department or Agency in the United States.

The undersigned certifies that he executed the above statement on behalf of and by the authority of the company filing this report, and that the information contained in this report, is correct and complete to the best of his knowledge and belief.

Prepared by .....
(Name of official)

(Date) (Title)

U. S. GOVERNMENT PRINTING OFFICE 16—24200-1

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4. Stocks by Grade of Scrap:

GRADES OF SCRAP	Stocks on Hand September 30		Scrap Consumed During October		Scrap Other than Dispersed of During October (Gross tons)	Stocks on Hand October 31		Scrap Due October 31[1] (Gross tons)	Estimated Tonnage Purchased During November (Gross tons)	Estimated Consumption of Purchased Scrap During November (Gross tons)
	Home (Gross tons)	Purchased (Gross tons)	Home (Gross tons)	Purchased (Gross tons)		Home (Gross tons)	Purchased (Gross tons)			
No. 1 Heavy melting										
No. 2 Heavy melting										
Bundles										
Low phos scrap										
Cast scrap										
Turnings and/or borings										
Rerolling rails										
Scrap rails										
Chromium-nickel stainless steel										
Chromium base stainless steel										
All compositions of SAE low-alloy steels										
All other prepared scrap										
Unprepared scrap										
Total scrap (all grades)										

5. Stocks of Pig Iron on Hand:

September 30 (gross tons) .....

October 31 (gross tons) .....

[1] Scrap purchased or otherwise acquired previously but not delivered to you by October 31.

16—24200-1

Description of Scrap Forms

THE THREE forms reproduced on these pages, PD-149, PD-150 and PD-151, must be completed and filed with the Bureau of Mines, Pittsburgh, by all scrap consumers, producers and brokers and dealers. The forms are to be filed by the 20th of each month, in connection with general preference order M-24. A producer is any person producing at least 50 gross tons in a month. If a producer is also a consumer, he files only the consumers form, PD-150. This latter form, PD-150, replaces the former OPA form 104:8 and the Bureau of Mines' report 6-830a MC. Form PD-151 replaces the Bureau of Mines' report C-830a MD. These forms may be reproduced using exact form and size. Each page of the forms is 8 by 12½ in.

Copies of these forms at cost will be supplied by The Iron Age, 100 East 42nd Street, New York, as a service to industry. These copies will be available until scrap producers, consumers and brokers are able to obtain copies through their regular sources of supply.

Car Shops Attain Peak in October

Pittsburgh

• • • **Freight cars produced** in October by freight car builders, excluding railroad shops, reached the highest total than in any month so far this year, as expected. A total of 7045 cars were produced, of which 425 were for export and the balance domestic. Car shops operated in October at approximately 50 per cent of rated capacity and about 68 per cent of practical capacity. For the first 10 months of this year car builders operated at 37 per cent of rated capacity and 51 per cent of practical capacity.

An increase in the shipment of plates to car builders in September and October was responsible for the October showing. There is a possibility that November and December might not match October output since extreme pressure is being placed on steel mills to step up plate shipments to Maritime, Navy, and lease-lend customers. This increase may be at the expense of car builders unless reallocation of orders now on the books can be brought about.

Freight Car Building Activity

October and September, 1941
(Railroad Car Shops Not Included)

Company	October	September	Monthly Capacity
American Car & Foundry Co...	1,699	1,611	4,775
Pullman Standard Car Mfg. Co.	2,304	1,117	4,000
Pressed Steel Car Co.	567	517	1,350
General American Transportation Corp...	767	524	1,300
Greenville Steel Car Co.	200	100	400
Bethlehem Steel Co.	620	572	800
Virginia Bridge Co.	0	0	300
Ralston Steel Car Co.	75	137	500
Mt. Vernon Car Co.	240	270	350
Pacific Car & Foundry Co...	223	240	250
Magor Car Co..	350	80	300

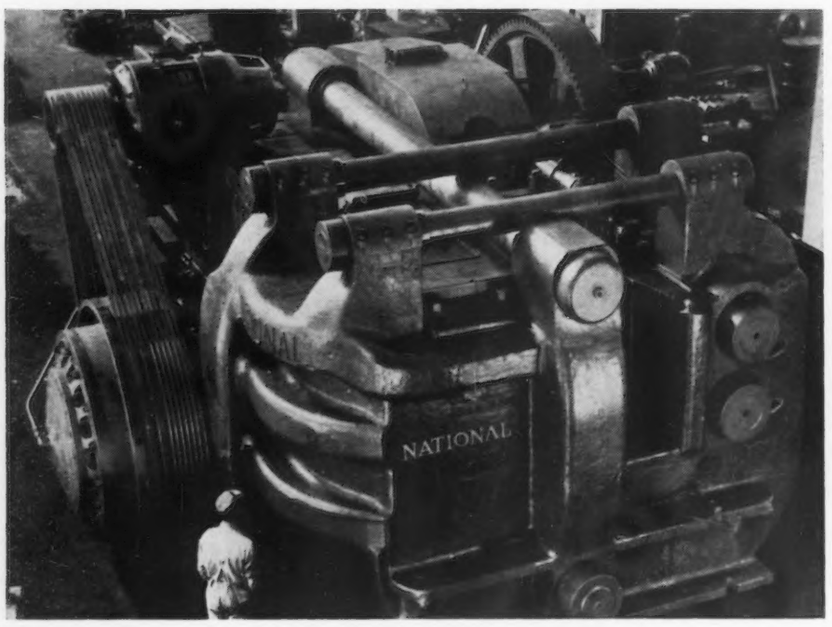
Freight Car Production

(Carbuilding Plants Only)

	Cars Produced	Per Cent of Capacity Rated*	Practical†
January	5,009	36	49
February	4,122	29	40
March	5,022	36	49
April	5,563	40	54
May	5,086	36	49
June	5,143	41	50
July	5,391	39	53
August	3,886	28	38
September ...	5,668	40	55
October	7,045	50	68
10 months..	51,035	37	51

*Based on 14,000 cars a month capacity.
†Based on 10,300 cars a month capacity.
Note: Above production figures also include cars made for export as follows: January, 16; February, 65; March, 35; April, 148; May, 550; June, 6; July, 100; August, 30; September, 624; October, 425; Total 10 months, 1999.

UPSET FORGING MACHINE: Ready to be shipped to Tube-Turns, Inc., Louisville, Ky., this huge 9-in. National Machinery Co., upset forging machine, said to be the largest of its kind, will be used to make airplane motor cylinder barrels from solid bar stock. Another forger will be delivered in February.



1942 Steel Allocation Asked by Oil Industry

Washington

• • • **Coming on the heels** of SPAB's refusal to give it steel for a proposed oil pipe line from Texas to Philadelphia and New York, the Office of Petroleum Coordinator Harold L. Ickes has laid before OPM an estimate of 5,846,000 tons of steel "to carry on operations in 1942 on a scale calculated to meet all demands of the defense program."

The Petroleum Coordinator's office said that the estimate was prepared for use of OPM in making allocations of steel during the coming year. The largest single item going to make up the total, it was stated, calls for 1,817,000 tons of tubular goods.

Each of the four operative divisions of the Office of Petroleum Coordinator collaborated in the comprehensive analysis of the steel requirements of the various branches of the oil industry and estimated the divisional 1942 requirements of each corresponding branch of the industry as follows:

See page 85 of the Nov. 13 issue for breakdown of finished steel shipments by consuming industries for last August, for the first eight months of 1941, for 1940 and for other years.

Division	Tons—Iron and Steel
Production (on basis of more than than 30,000 wells)	3,175,000
Transportation (for pipelines, tank cars, tank trucks)	1,843,000
Refining (including aviation gasoline facilities)	647,000
Market	181,000
TOTAL	5,846,000

The Petroleum Coordinator's office said that the production branch is the nation's biggest user of pipe and "as such is probably also the largest permanent user of steel by reason of the fact that much of the steel casing used in wells is necessarily cemented in the ground and is forever irrecoverable."

Negotiations Reported On Aluminum Mills

Pittsburgh

• • • **The Defense Plant Corp.** this week was reported negotiating a $40,000,000 contract with United Engineering & Foundry Corp. for construction of two aluminum rolling mills on the Pacific Coast. Sites have not been selected, but the general areas of Portland, Ore., and Los Angeles are reported being studied.

British Machine Tool Sales To S.A. Called "Bunk"

Sidney, Ohio

• • • **Assorted rumors** to the effect that British machine tools are being shipped to South America were labeled as "pure bunk" by Charles A. Moore, OPM machine tool representative and recently the machine tool advisor to Harriman's Commission that visited Great Britain. Mr. Moore pointed out that British records were made available to the Amerigan delegation and that it would have been quite obvious to our representatives if any such activity were actually going on. At the same time, Mr. P. H. Mills, controller general of machine tools for Great Britain, pointed out to THE IRON AGE that machine tool shipments are entirely under the control of the British government and that to his knowledge no manufacturer of any vital war machines is selling equipment abroad.

This fact was brought out in an interview, during which Mr. Mills spoke of the increasing use of women in British machine tool plants. In this respect Mr. Mills stated that English women were being used on the second and third shifts although married women are frequently put on "half shifts," usually in either the morning or afternoon. By breaking down the operations in a machine tool plant the British have been able to use as high as 40 per cent female labor at some plants without any important loss in accuracy or handicaps to production.

Naturally, various concessions are made to women employees such as shopping services and special rest periods. Mr. Mills stated that usually women supervisors worked out most favorably in handling employees of their own sex.

Production of vital machine tools in Great Britain has been significantly speeded up with the aid of simplification of specifications and elimination of unnecessary frills, Mr. Mills said. He proudly displayed an album containing photographs of several machine tool plants which had been damaged in bombing raids but which were completely rebuilt and back in production within 90 days.

Defense Committees Are Appointed

Washington

• • • **OPM has** announced appointment of a plumbing and heating defense industry advisory committee and an oil burner and stoker subcommittee. Members of the plumbing and heating committee include:

George Hoffman, manager, plumbing division, Crane Co., Chicago; William M. Byrd, vice-president, Alabama Pipe Co., Anniston, Ala.; E. S. White, president, U. S. Radiator Corp., Detroit; W. L. McGrath, vice - president, Williamson Heater Co., Cincinnati; E. C. Sammons, vice-president, Iron Fireman Co., Portland, Ore.; J. A. Doucett, vice-president, Revere Copper & Brass, Inc., New York; R. L. O'Brien, president, Detroit Brass and Malleable Co., Detroit; O. L. Swats, assistant sales manager, Grinnell Co., Inc., Providence, R. I.; M. W. Dennison, Braman Dow & Co., Boston; L. F. Hudepohl, president, T. S. Conner, Inc., Cincinnati; H. M. Reed, president, American Radiator & Standard Sanitary Corp., New York; Charles D. Wessells, president, D. D. Wessells & Sons Co., Detroit; M. F. May, vice-president, Young Radiator Co., Racine, Wis.; Frank C. Packer, Payne Furnace & Supply Co., Beverly Hills, Calif.; Harold Sweatt, president, Minneapolis-Honeywell Regulator Co., Minneapolis; N. H. Wiewel, assistant general sales manager, Jones & Laughlin Steel Corp., Pittsburgh; R. L. Stewart, vice-president, Stockham Pipe & Fittings Co., Birmingham, Ala.; G. E. Mumma, Sears, Roebuck & Co., Chicago; and Edward Costello, Costello Engineering Co., Washington, D. C.

Members of oil burner and stoker subcommittee are:

E. C. Sammons, vice-president, Iron Fireman Co.; J. R. Rainbault, manager, A.C.C.R. Department, General Electric Co., Bloomfield, N. J.; J. H. Simpson, vice-president, Hershey Machine and Foundry Co., Manheim, Pa.; Ross Sherman, president, Silent Glow Burner Corp., Hartford, Conn.; and L. A. Welsh, president, Hart Oil Burner Co., Peoria, Ill.

Cut in Varieties and Models Advocated

Washington

• • • **In a move** to save vital materials both for national defense and civilian use, Lessing J. Rosenwald, chief of the Bureau of Industrial Conservation, last week urged simplification of design in manufactures along with reduction in the number of varieties or styles in products. He cited decreases in the cost of manufacture, distribution, and inventory, with a quicker turn-over.

Those seeking to cooperate with the program are asked to follow recommendations to be issued by the Bureau.

WHERE STEEL GOES: A 10-in. coast defense gun, together with its mountings, takes 702,000 lb. of steel, or the equivalent of 350 automobiles, 31,000 refrigerators or 4600 washing machines. J. R. Patterson, vice-president of Mackintosh-Hemphill Co. is shown above inspecting a side frame section of a 16-in. gun with Maj. G. H. Knode, Pittsburgh artillery inspector. These frames are made in the company's Midland, Pa., plant.

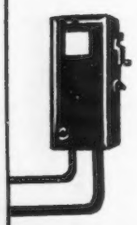
International News



Bill-- Here's a tip to help you get that new plant operating sooner

"We've found that we can save as much as 50% of the time required for installing control by using G-E combination starters for the motors in our plant." ★

HERE'S WHY G-E COMBINATION STARTERS CAN BE INSTALLED MORE QUICKLY



THIS	Instead of	THIS
1	Devices to mount	2
2	Lengths conduit to cut	3
2	Conduit ends to thread	4
6	Wires to pull	9
6	Power connections to make	12





★ *Statement by R. L. Mitchell, master mechanic, Fernstrom Paper Mills, Inc., Pomona, Cal.*

GENERAL ELECTRIC

Chicago Area Arms Output 25% of Capacity, Says Army

Chicago

• • • **Not more than five or** six manufacturers are behind on their delivery promises due to managerial inefficiency in more than $600,000,000 worth of contracts under the supervision of the Chicago Ordnance district, and no manufacturer is more than eight weeks late in deliveries, according to Col. Donald Armstrong, executive officer of the district. Col. Armstrong said contracts placed so far are only one-quarter of the way to the saturation point for the district. He also said the real period of plant expansion for defense in this area is in the offing. There are now 426 prime contractors and 7267 subcontractors engaged in ordnance work, and the Illinois area is producing ordnance material at a rate equal to 5.1 per cent of all manufactured goods in 1939. The Chicago ordnance area is second to the Philadelphia district.

Transship Iron at Buffalo

Buffalo

• • • **For the first time** in nearly three months a cargo of pig iron was transferred from a lake steamer into barges here this week. The iron, brought from Cleveland, is bound for New York.

Coming Events

Dec. 1 to 6—18th Exposition of Chemical Industries, Grand Central Palace, New York.

Dec. 3 to 5—Institute of Cooking and Heating Appliance Manufacturers, annual convention, Cincinnati.

*Dec. 6 to 13—National Motor Truck Show, Philadelphia.

January, 1942—American Society of Heating & Ventilating Engineers, annual exposition, Philadelphia.

Jan. 12 to 16—Society of Automotive Engineers, annual meeting and engineering display, Detroit.

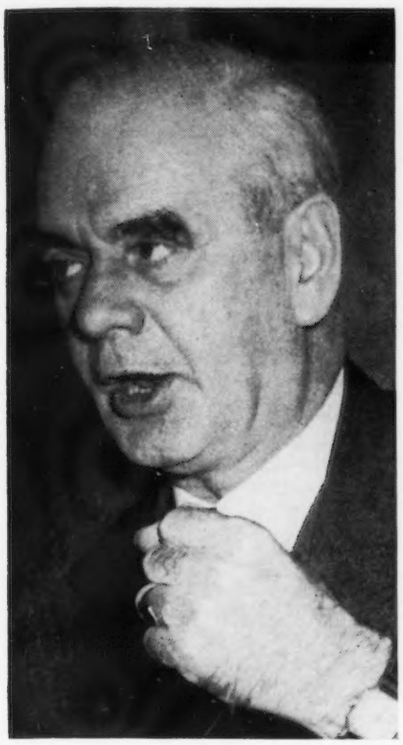
Jan. 20 to 22—Western Retail Implement & Hardware Association, annual exposition, Kansas City.

Feb. 23 to 28—Automotive Service Industries Show, Atlantic City, N. J.

April 14 to 17—Packaging Exposition and Conference, Hotel Astor, New York.

April 15 to 18—Electrochemical Society, spring convention, Nashville, Tenn.

*Tentative.



Associated Press Photo

I QUIT: Philip Murray, president of the CIO and vice-president of the United Mine Workers, last week resigned his membership on the National Defense Mediation Board after the board's 9 to 2 vote against a compulsory closed shop in coal mines owned by steel companies. Thomas Kennedy, UMW secretary-treasurer, also resigned.

Dominion Plate Mill Ready to Produce

Toronto

• • • **Dominion Steel & Coal Co.,** Sydney, N. S., is completing new installations which will increase production of steel. C. D. Howe, minister of munitions and supply, stated last week that the steel plate mill of the company is being placed in operation to make plate for warships. Progress also is reported in construction of a new open hearth furnace, planned to go into production early next year, which will step up steel ingot capacity from the present rate of 600,000 tons to 670,000 tons per year. With the new furnace now being installed, the company's capacity for ingots over pre-war level will have been increased by 270,000 tons or 70 per cent.

Named to OPM Post

• • • **Appointment of** Erwin Rankin as financial consultant for the OPM contract office at New York was announced this week by W. O. Crabtree, state director of the contract distribution division.

Thanks Joe . . . we're already using combination starters . . . they're safer



"We have found that our men can maintain G-E combination starters without danger, thanks to the safety-interlocked enclosure which separate units do not have."★



1 **SAFER** because the circuit switch has ample capacity to interrupt stalled-rotor current of the controlled motor.

2 **SAFER** because the cover can't be opened as long as the switch handle is in the ON position and power is applied to exposed parts.

3 **SAFER** because, whenever the cover is open, power can't be applied to the starter by accidental closing of the switch handle.

★ *Statement by Raymond Dingler, chief electrician of a large western cement plant*

Send for "How to Get More for Your Control Dollar" (GES-2456) General Electric Company, Schenectady, N. Y.

GENERAL ELECTRIC



MANY A MAN TODAY

IS THANKING HIS LUCKY STARS HE KNEW ABOUT THESE STEELS

Back in the days when cost was a big factor, many a man depended on ELASTUF Steels because they cut the making time from bar to finished part. Today, when speed is the essential, that same facility of ELASTUF Steels has become doubly important. Speed in selection through the Machinery Steel Selector. Speed in handling because the uniformity of the steels presents no machining problems. Speed through elimination of heat treatment. Speed because of the assurance of dependable service in *all* ELASTUF Steels.

Today . . . tomorrow, the eight points of ELASTUF which contribute to faster production can be valuable allies to the steel buyer. Read them now.

EIGHT REASONS THAT RECOMMEND ELASTUF STEELS TO YOU

1. Proven performance in all branches of industry.
2. Known physicals in all diameters up to 8".
3. You can pick the right steel without guesswork.
4. Machinable in ready-for-use condition.
5. A single related group blanketing the machinery steel field.
6. Uniform quality and performance.
7. No premium in cost over other steels.
8. Available (subject to regulations governing priority) at nearby points.

SELECTOR ENDS GUESSWORK

By giving steel data in terms of ready-for-use physicals, the Machinery Steel Selector enables you to pick the *right* steel in any size up to 8" without guesswork. Use your Selector—for another one, write the nearest point listed below.

ELASTUF STEELS



BEALS-McCARTHY & ROGERS • BUFFALO-ROCHESTER
BROWN-WALES CO. • BOSTON, MASS.-LEWISTON, ME.
HORACE T. POTTS CO. • PHILADELPHIA-BALTIMORE

Canada Spends 9 Million On New 3.7-in. Gun Plant

Ottawa

• • • C. D. Howe, Minister of Munitions and Supply, announced authorization of a capital expenditure of $9,000,000, to increase by 600 per cent the monthly output in Canada of 3.7 inch anti-aircraft guns. Construction of a plant for producing mobile mountings for the guns will be started immediately. Another firm, which has been producing barrels for the 3.7 inch gun, soon will begin to make the complete breech mechanism, thus manufacturing the entire gun under one roof. Mr. Howe also stated that Canada soon will cooperate with Great Britain in the production of the barrel for another type of anti-aircraft gun, and that large contracts for barrel forgings and machining have already been placed with two Canadian factories.

Three Arms Plants at St. Louis Near Completion

St. Louis

• • • **Three huge armament** plants will soon be turning out equipment here. Production by the end of the year is predicted for the world's largest airplane gun turret plant, costing $10,500,000, to be operated by the Emerson Electric Co. Orders on hand are about $46,000,000.

The world's largest small arms ammunition plant, government owned, costing $100,000,000, is expected to begin production late this month, under management of United States Cartridge Co., subsidiary of Western Cartridge Co.

Partial production has already been reached in the armor-piercing core operations of McQuay-Norris Mfg. Co.

Army Opens Buffalo Office

Buffalo

• • • **Army ordnance inspection** and engineering in this area's plants were taken over this week by Lt. Fred B. Lehner, recently placed in command of the new War Department Ordnance Office here. Nearly 150 inspectors will work out of the new office.

Mill Suppliers Query Plants For Equipment

Buffalo

• • • **Mill supply houses here plan to canvass their factory customers to gather idle obsolete machinery and other materials, as part of a national campaign by the Industrial Supply Industry Division of the National Defense Committee to acquire unused equipment, list it and arrange for transfers to factories which need it.**

Buffalo members of the national organization include the R. C. Neal Co., Inc., Don F. Johnson & Co., Inc., Beals McCarthy & Rogers, Inc., Root Neal & Co., Peerless Mill Supply Co., Hartfield-Healy Supply Co. and H. D. Taylor Co.

OPM Steel Furniture Order May Close Buffalo Firms

Buffalo

• • • **Three Buffalo metal** furniture manufacturers have had to cut production and personnel to such an extent that, with last week's OPM order still further cutting into their material, two of the concerns report they may have to suspend business.

The 50-year-old Buffalo Metal Furniture Manufacturing & Plating Co. already has cut factory personnel 88 per cent. "I'll just have to lock up and quit," said the president. The Semco Furniture Corp. has cut its output 75 per cent and is getting only 25 per cent of the steel obtainable six months ago. Personnel has been cut 55 per cent. The firm's president said, "Looks like we'll have to get defense orders or close up." Executives of the Logan Metal Furniture Co. said production had been cut about 60 per cent.

Lamson & Sessions Honors 22 50-Year Employees

Cleveland

• • • **Lamson & Sessions Co.** honored 22 employees who have served 50 years with the company, at a dinner Nov. 15. Four hundred employees of 15 years or longer, about 25 per cent of the company's total personnel, also attended.

AN INCH... OR A MILE



PLYMOUTH *Flexomotives* DO THE KIND OF HAULING STEEL MILLS WANT.

That's why Plymouth Flexomotives are at work in many of the nation's largest steel plants. On the level or on the grade Flexomotives take the heaviest loads and place them exactly where they're wanted . . . without loss of time or delay. Flexomotive's availability and flexibility save precious man-hours during this period of high defense production.

Designed expressly for heavy industrial switching, Plymouth Flexomotives will meet your requirements not only in handling loads, but will show a big saving in operating costs.

Plymouth Flexomotives hold outstanding records in:

ECONOMY ..... 20% less fuel.
MAINTENANCE ... Lowest ever recorded.
EFFICIENCY ..... From 83% to 88% average over entire speed range.
AVAILABILITY .... 95% to 97% availability in 24-hour service.

THERE'S A PLYMOUTH FLEXOMOTIVE WORKING NEAR YOU. GET THE RECORD...

Write

PLYMOUTH LOCOMOTIVE WORKS

***Division of* The Fate-Root-Heath Co., Plymouth, Ohio**

PLYMOUTH *Flexomotive*

DOLLAR FOR DOLLAR

THE GREATEST DIESEL LOCOMOTIVE EVER BUILT

Smalley Made President Of Meehanite Institute

• • • **Oliver Smalley,** president of the Meehanite Metal Corp., Pittsburgh, was reelected president of the Meehanite Research Institute of America, Inc., at the 13th annual meeting of the institute in Cleveland recently. H. B. Hanley of American Laundry Machinery Co. was chosen vice-president and Frank M. Robbins of the Ross-Meehan Foundries was elected secretary-treasurer.

A gold watch was presented at the meeting to A. C. Denison, of the Fulton Foundry & Machine Co., Cleveland, for meritorious service. Some 35 papers pertaining to developments in foundry and metallurgical practice were discussed.



METAL BREW: This gas furnace is used by Westinghouse Electric & Mfg. Co. to reclaim non-ferrous scrap at its Linhart plant. This conservation program of Westinghouse resulted in the reclamation of 1,180,000 lb. of non-ferrous metals in October, including some 60 tons of aluminum. Westinghouse also salvages manila paper, blueprint paper and corrugated cardboard.

Bureau of Standards Cuts Metal Lath Varieties

Washington

• • • **The Division of Simplified** Practice, Bureau of Standards, has put into effect a further reduction in varieties of metal lath. In 1924 the Bureau reduced 125 varieties of metal lath to 24. The latest revision is expected to reduce inventories carried by mills and warehouses, by 30 per cent and to simplify the rolling of sheets for these products.

Wickwire Spencer Declines Republic Steel Offer

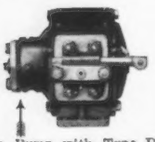
• • • **Directors of Wickwire** Spencer Steel Co. have declined an offer of Republic Steel Corp. to buy the assets of the company, reportedly for $16 per share. George W. Treat, chairman of Wickwire Spencer, said quick assets were approximately $16.64 a share. He pointed out the offer had to be approved or rejected in its entirety.



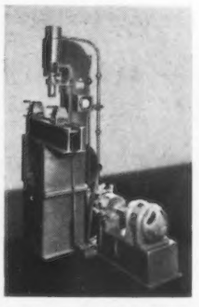
NOTED FOR REVERSIBILITY

Hele-Shaw Fluid Power solves one of the tough jobs of machine design and operation — easy reversal. Fluid Power is oil under pressure from a Hele-Shaw Pump. It flows from the pump through pipes to the driven machine. The direction of this flow is changed by merely shifting the position of the guide rods on the pump. You can reverse the direction of flow easily and quickly. Fluid Power is smooth. It is shockless, cushioned by the oil medium. That's why, in presses, rams, or reciprocating devices, fluid power reversing is seldom equalled by any other method. And that's one of the reasons — among many others shown in our catalog—why Hele-Shaw Fluid Power is being used more and more.

NOTE IT FOR REVERSIBILITY



Hele-Shaw Pump with Type D Regulator — This regulator reverses direction of flow, gives any rate of discharge from zero to maximum in either direction.



20-TON RIFLE BARREL STRAIGHTENER, manufactured by the Watson-Stillman Co. Operated by Hele-Shaw Pump with a Type D Control.

THE Hele-Shaw Fluid Power Pump

OTHER A-E-CO PRODUCTS: LO-HED HOISTS, TAYLOR STOKERS, MARINE DECK AUXILIARIES

AMERICAN ENGINEERING COMPANY

2410 ARAMINGO AVENUE, PHILADELPHIA, PA.



ICKES VISITS FRIANT: Less than two years ago, Harold L. Ickes, Secretary of the Interior, officiated at the formal start-of-work ceremonies at Friant Dam, near Sacramento, Calif. A week ago, on an inspection tour, he found the structure 90 per cent complete. Ickes is shown here with Mrs. Ickes and John C. Page, Commissioner of the U. S. Bureau of Reclamation. The sign on the bucket tells its own story.

Steel Corp. Shipments Set Another Record

• • • **Shipments of** finished steel products by subsidiary companies of United States Steel Corp. for October, 1941, were 1,851,279 net tons, an all-time monthly record, compared with 1,664,227 net tons in September and 1,572,408 net tons in the corresponding month in October, 1940.

For the year 1941 to Nov. 1, shipments were 16,988,715 net tons compared with 12,006,135 net tons in the comparable period of 1940, an increase of 4,982,580 net tons.

Desvernine Back in Law

• • • **R. E. Desvernine,** who recently resigned as president of Crucible Steel Co. of America, has returned to the practice of law and has formed a partnership with Eugene L. Garey, in New York. The new firm will be known as Garey, Desvernine & Garey with offices at 63 Wall Street.

No Time for Theorizing, Says Admiral Standley

Sidney, Ohio

• • • **"Theorizing"** by Americans "concerning whether or not we are in the war" was sharply criticized by Admiral William Harrison Standley, U. S. Navy, during the presentation of the Navy "E" Pennant to Monarch Machine Tool Co. on Nov. 11, as he reminded his listeners that the men of our fleet and the Russian people now on the firing line have no time for such theorizing. During his talk, the Admiral discussed his recent visit to Russia where he saw lathes with only temporary beds so "that they could be moved if the Germans came too near."



Electrically-controlled rolling doors made of ARMCO Galvanized ZINCGRIP-PAINTGRIP are doing their bit in Uncle Sam's fast-moving defense job. On ships, airplane hangars and in manufacturing plants rolling doors like these take a constant beating.

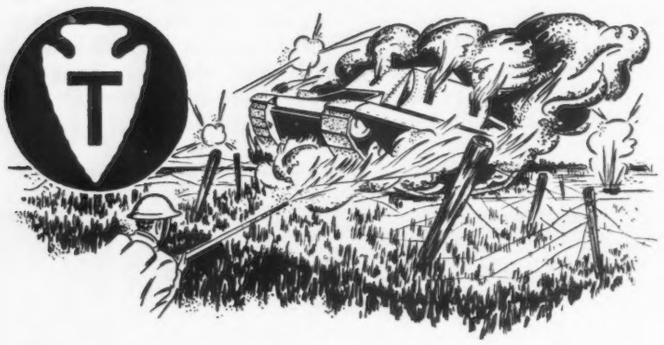
As it did for peace-time products (and will again), ARMCO Galvanized ZINCGRIP-PAINTGRIP assures long life and low upkeep cost for many defense applications. Here is why: The base metal is protected by three surface coatings.

First is the unique ARMCO ZINCGRIP coating. The zinc won't peel, even in severe forming and moderate cold drawing operations. Next is the PAINTGRIP coating which *takes* and *preserves* paint. It needs no pre-treatment. Peeling and flaking of paint is greatly retarded because the bonderized film insulates the paint from the zinc.

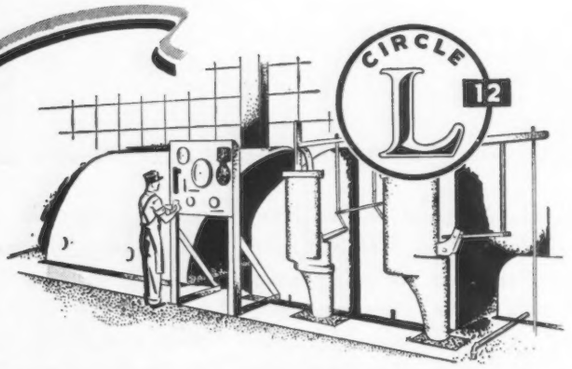
Now is a good time to learn how galvanized ARMCO ZINCGRIP-PAINTGRIP can help you in the design, manufacture and service of your future peace-time products. Write The American Rolling Mill Co., 3201 Curtis St., Middletown, Ohio.

ARMCO ARMCO **ZINCGRIP-PAINTGRIP**

SYMBOLS of DEFENSE



MEN from the oil fields of Texas are wearing once more the blue arrowhead of the AEF's 36TH Division. In World War I, this Division included National Guardsmen from Oklahoma as well as from Texas and its combat record reflects the best fighting traditions of the rugged Southwest. Furious assaults by the 36TH vitally assisted the French army to advance at a critical period in the Meuse-Argonne operations. Casualties totalled 2,584. Today, the men of Texas wear the blue arrowhead as one of the proudest battle emblems of the democracy they are prepared to guard against any threat.



PROUD EMBLEM in industry's defense campaign is Circle Ⓛ 12—symbol for Lebanon's 12% to 14% alloy. Its characteristics fit it especially for the handling of hot oil and high temperature steam. Circle Ⓛ 12 is one of the Lebanon alloys which, throughout the years, has made possible changes in methods and practice of far reaching economic value. One or more of these alloys may solve production problems for you. Consult a Lebanon metallurgist.

LEBANON STEEL FOUNDRY • LEBANON, PA.

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON *Stainless and Special Alloy* STEEL CASTINGS

Battles for Rating To Get Rubber Bands

Racine, Wis.

• • • A new approach for getting priorities in a non-defense business has been discovered by Western Coil & Electrical Co., which can't get enough rubber bands to keep up production of model planes. In asking for a priority, the firm's president said that model planes were the most definite factor in keeping American youth airplane conscious. The official also argued that three of his younger employees had been released for duty with the air corps—one as instructor, the others for assembling aviation instruments and building wind tunnel models.

One hundred workers will have to be laid off if the rubber band ratings do not come through, he said. Racine is one of the cities designated by OPM as an area facing unemployment due to shortages.

Installation Time for Furnace is 52 Hours

Cleveland

• • • **Republic Steel Corp.** set what is probably a world's record in the installation of electric furnaces in connection with its newest expansion at Canton. The new furnace, the eighth 50-ton furnace added since early in 1940, was installed and put into operation in 52 hr. compared to 166 hr. required on the first furnace less than two years ago.

The installation of this furnace gives Republic a total electric steel capacity of more than 700,000 tons a year, compared with 146,000 tons at the end of 1939.

Elaborate Program Set For "E" Award to C-I

• • • **Admiral** William H. Standley, U.S.N. (Ret.), will be in Pittsburgh on Nov. 21 to officially present the Navy "E" pennant to Carnegie-Illinois Steel Corp. at impressive ceremonies. The program begins with an inspection tour of Homestead works by Admiral Standley and his staff during the afternoon and concludes with a giant meeting in Hunt Armory, opening at 8.30 p.m., before an audience of at least 8500.

Trade Notes . . .

Cold Metal Process Co., Youngstown, Ohio, announces the recent organization of a subsidiary company—Cold Metal Products Co.—which will take over the manufacturing operations formerly conducted by Cold Metal Process Co. The manufacturing operations include two divisions: (1) The designing and building of rolling mills and accessory equipment, and (2) the Strip Steel Division which produces special sizes and qualities of precision cold rolled strip steel.

●

Modern Motor Drives, Inc., Elkhart, Ind., is now manufacturing the complete line of "Modern Motor Drives," formerly made by Quailty Hardware & Machine Corp., Chicago. A number of improvements have been made in the product, but the same basic design is retained. Belt tension is adjustable through a crank and screw control that actuates a cam working directly against the base of the motor and drive shaft mounting. These drives are applicable to the motorization of lineshaft driven machine tools and other production machinery.

●

Packless Metal Products Corp. has moved its office and plant to new and larger quarters at 31 Winthrop Avenue, New Rochelle, N. Y.

●

Sheldon Machine Co., Inc., builder of precision lathes, arbor presses and machine vises, has moved into a new plant just completed at 4240-58 Knox Avenue, Chicago.

●

Detroit Ball Bearing Co., 110 West Alexandrine Avenue, Detroit, has under construction a building at 48 West Fulton Street, Grand Rapids, Mich., which the Grand Rapids branch expects to occupy before the end of this year. Previously this year the company established a branch in Saginaw.

●

J. Lee Hackett Co., has opened new warehouse and office quarters at 1961 East Milwaukee Street, near St. Aubin, Detroit.

●

Chase Drier & Chemical Co. has removed its offices from 3505 Smallman Street, Pittsburgh, to 4150 East 56th Street, Cleveland.

●

U. S. Pipe & Foundry Co. has purchased machine tools to machine 105-mm. shells at its North Birmingham, Ala., plant. Production is expected to get under way about the first of next year.

●

Roller-Smith Co., Bethlehem, Pa., maker of switchgear, oil and air circuit breakers and electrical instruments, has appointed Electrical Jobber Equipment Co., Minneapolis, its sales agent for Minnesota, North Dakota, South Dakota, and western Wisconsin.

●

Pittsburgh Tube Co., Pittsburgh, has appointed Standard Tube Sales Corp., 1 Admiral Avenue, Maspeth, N. Y., as eastern representative on welded mechanical tubing.

●

Lofland Co., distributer of construction materials, Dallas, Tex., has moved its office to the fabricating plant at 2120 Lofland Avenue, that city.

●

Lukens Steel Co., By-Products Steel Corp. and Lukenweld, Inc., have closed their Pittsburgh sales office. Communications will be handled by the general sales office at Coatesville, Pa.

●

Reed-Prentice Corp., Worcester, maker of machine tools, announces that its Cleveland office, Penton Building, 1213 W. 3rd Street, is now headed by Mr. A. R. Morse.

●

Ampco Metal, Inc., Milwaukee, announces the transfer of Frank A. Burnett from its Cincinnati office to its office at 3335 College Ave., Indianapolis.



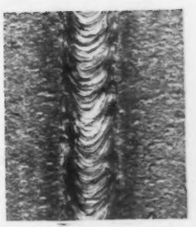
To Resist Heat and Corrosive Gases

Use "HARSTAIN 18-8"

These stainless steel air ducts for heat-treating furnaces are subjected to temperatures up to 1500° Fahrenheit. "Harstain 18-8" has proved to be the ideal electrode for welding them. Providing fine penetration, it also resists oxidation from corrosive gases at high temperatures. This austinitic stainless steel electrode has a base wire sufficiently higher than a 18-8 stainless steel, assuring deposit metal with minimum of 18% chrome and 8% nickel. Suitable for all-position welding with standard procedures. Write for full information.

P&H WELDING ELECTRODES

A FREE-FLOWING ELECTRODE . . .
FLUX COATING EASILY REMOVED



The flux coating of "Harstain 18-8" was found to be more easily removed — clean-up time was faster — than with any other electrode used. Smooth clean welds are laid quickly and easily and with excellent color match. . . . Write for literature.

General offices: 4401 W. National Avenue, Milwaukee, Wisconsin

HARNISCHFEGER
CORPORATION
WELDING ELECTRODES • MOTORS • HOISTS P&H ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

AID THE OPM SCRAP COLLECTING CAMPAIGN

● In advertisements recently published we have urged users of iron and steel to return their scrap through usual scrap trade channels to steel mills, blast furnaces and foundries with all possible haste.

● We continue to make this plea on behalf of the National Defense Program, which is highly dependent on steel for acceleration of production so vitally important at this crucial period.

● Manufacturers of products from steel who do not have priority ratings have an especial interest in speeding the flow of scrap—only by thus aiding the production of steel will they be able to obtain their share of whatever steel is available after defense needs are provided for.

● This company desires to be of every possible service to scrap producers in facilitating the collection, preparation and shipment of scrap. We have been specialists in iron and steel scrap for 40 years and shall be happy to place our experience and facilities at your disposal.

● The Office of Production Management is about to inaugurate a nation-wide Scrap Collecting Campaign. It is our desire to assist in every possible way.

The CHARLES DREIFUS Company

(Broker in Iron and Steel Scrap for 40 years)

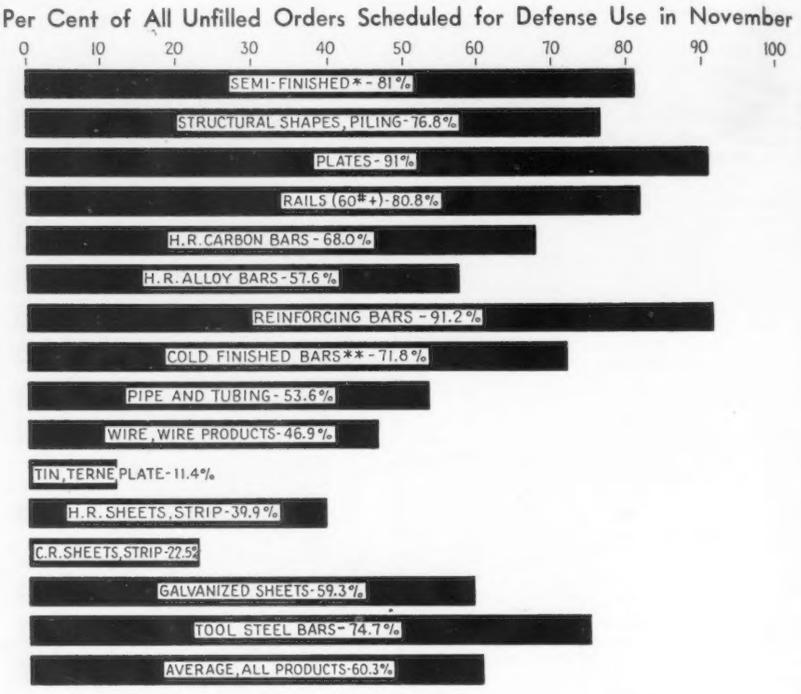
Philadelphia, Pa.
Widener Bldg.
Rittenhouse 7750

Pittsburgh, Pa.
Oliver Bldg.
Atlantic 1856

Worcester, Mass.
Park Bldg.
Worcester 6-2535

War Orders Cover 60% of November Steel Backlog

• • • (November unfilled orders, by percentages for principal products, appear in the bar chart below. Complete breakdown of steel backlogs for delivery in other periods, according to the OPM Iron and Steel Branch, are shown in the table).



* Includes ingots, blooms, billets, slabs, tube rounds, sheet and tin bars

** Includes carbon and alloy

Source: Office of Production Management

The Iron Age

• • • Statement of Unfilled Orders and Commitments Classified in Accordance with the definitions on Form PD-73 for Groups A (Army-Navy), B (other U. S. Government), C (Lend-Lease), D (Division of Priorities) and F (Warehouses) as of September 30, 1941.

(Net Tons)

Products	October 1941 Defense Orders	October 1941 Per Cent of Total	November 1941 Defense Orders	November 1941 Per Cent of Total	Later Months Defense Orders	Later Months Per Cent of Total
Ingots, Blooms, Billets, Slabs, Tube Rounds and Sheet and Tin Bars	446,438	79.2	433,347	81.0	787,289	68.1
Structural Shapes and Piling	333,063	81.7	281,263	76.8	1,101,385	74.0
Plates (Universal and Sheared)	485,260	89.6	465,436	91.0	2,884,598	81.7
Rails—Over 60 lbs.	128,982	93.4	116,387	80.8	1,070,518	67.1
Rails—All Other	9,766	84.5	4,607	73.7	38,067	70.4
Tie Plates and Track Accessories incl. Track Spikes	61,373	72.3	60,353	79.4	386,417	78.1
Hot Rolled Bars—Carbon incl. Hoops and Bands	376,584	65.8	351,784	68.0	1,219,294	55.6
Hot Rolled Bars—Concrete Reinforcing	152,734	87.2	156,026	91.2	438,381	79.0
Hot Rolled Bars—Alloy	94,513	61.6	69,925	57.6	219,592	68.8
Cold Finished Bars (Carbon and Alloy)	69,522	69.1	65,294	71.8	355,685	71.2
Pipe and Tubes	257,525	59.8	173,727	53.6	350,710	41.6
Wire Rods	54,361	52.1	45,850	46.1	93,281	28.1
Wire and Wire Products incl. Fence Posts	179,621	53.9	135,557	46.9	214,689	41.3
Black Plate	3,870	9.5	6,703	18.1	3,359	4.2
Tin and Terne Plate	38,487	10.1	37,013	11.4	81,277	10.6
Sheets and Strip—Hot Rolled	312,676	37.5	249,247	39.9	627,199	25.5
Sheets and Strip—Cold Rolled	107,552	24.6	57,665	22.5	199,153	18.4
Sheets and Strip—Galvanized	79,119	58.7	58,029	59.3	206,539	52.0
Sheets and Strip—All Other	9,262	33.3	8,498	34.9	24,444	24.8
Tool Steel Bars	4,128	70.7	4,219	74.7	10,813	78.3
Wheels and Axles	45,374	93.1	42,099	95.2	175,717	91.2
Forgings—Armor Plate and Ordnance	39,344	100.0	41,753	100.0	506,437	100.0
Forgings—All Other	10,667	87.7	8,543	89.5	61,620	93.1
Steel Castings	5,898	90.0	5,036	96.6	25,628	91.4
Skelp	9,864	13.0	9,009	12.7	80,058	40.5
All Other	13,910	74.3	11,618	72.4	45,021	72.1
Total	3,329,893	58.6	2,898,988	60.3	11,207,171	57.4

Number of Companies Included 113—which represent 94.0% of total estimated capacity of the industry

Extra! Dealer Has Optimistic Report

Cleveland

• • • **A scrap dealer here came out of the doldrums long enough to report incoming scrap at a higher rate than during any month since last July, with outgoing shipments up 20 per cent. He attributes this improvement to "a greater public realization of the seriousness of the scrap situation and its relationship to the defense program, greater compliance with stricter Federal regulation, and threatened punitive action for violations."**

Wood May Replace Plastics In Radio Cabinets

• • • **Mycalex, an inorganic insulating plastic,** can now be molded into rather intricate shapes by the injection process, similar to the organic plastics, Paul B. Leverette, of the General Electric plastics department, Pittsfield, Mass., said at the fall meeting of the Radio Manufacturers Association at Rochester, N. Y. There is a growing demand for Mycalex in the field of electronic devices used in national defense, particularly in radio, he said, and the application has been simplified by injection molding.

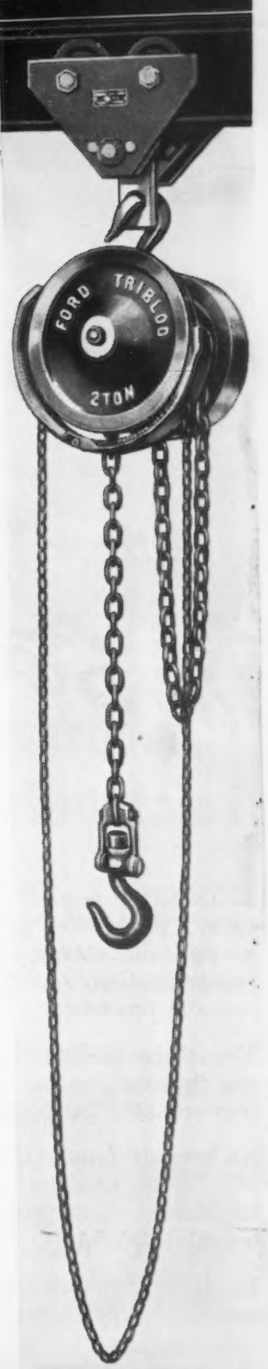
Cabinet and decorative uses account for by far the larger volume of plastics materials in radio construction. Phenolic and urea plastics are principally used for this application, and national defense has created a shortage of both for this purpose. At present, Mr. Leverette said, there is no alternative in plastics which is not just as short in supply, and therefore the only answer for cabinets and control knobs during the shortage seems to be a return to wood.

Car Builders Get Awards

Chicago

• • • **Contracts for** more than $80,000,000 in M-3 medium sized tanks for the United States Army have been placed with the Pullman-Standard Car Mfg. Co., and Pressed Steel Car Co. Both companies are building the same tank for the British.

FORD TRIBLOCS Put "Produce" in Production



☆ **FORD TRIBLOCS** are on the "critical list." But we know your need for fast, safe material handling and both the factory and Ford distributors are doing everything possible to meet your need. If we can supply you with **TRIBLOCS** you will have an implement that will last for years, —"on the job," ready for use, at all times.

The **FORD TRIBLOC** is a quality spur-gear hoist. It is made throughout of high grade drop forgings and malleable castings of certified grade. Its ACCO High Carbon Heat Treated chain has great strength and high elastic limit. Ford hoists must stand a 50% overload test before shipment.

Write for information on **TRIBLOCS** in ¼-ton to 40-ton capacities.

FORD CHAIN BLOCK DIVISION
PHILADELPHIA, PENNSYLVANIA

In Business for Your Safety

ACCO

AMERICAN CHAIN & CABLE COMPANY, Inc.

Inland Expansion Urged By Knudsen

Washington

• • • **Expansion** of the plant of Inland Steel Co., Indiana Harbor, Ind., by increasing open hearth capacity and adding two Bessemer converters together with a more advantageous use of existing facilities was recommended last week by OPM Director General Knudsen to the Defense Plant Corp.

At the same time, Mr. Knudsen asked the DPC to finance an addition of 24,000 tons of electric alloy steel ingot capacity for the Babcock & Wilcox Tube Co. plant at Beaver Falls, Pa., together with various finishing facilities to permit more of the plant's capacity to be turned to increased output of aircraft bearing tubing and tank-tread pins and bushings.

The proposed expansion at the Inland plant is in addition to the two blast furnaces which DPC has agreed to finance. These furnaces will have annual capacity of 900,000 tons of pig iron and at OPM it was said that they, with a blast furnace the company is erecting, will balance all requirements for scrap and offset a scrap shortage.

W. A. Hauck, OPM Iron and Steel Branch consultant, said the new Inland increase will "by utilizing existing finishing facilities including equipment and buildings, be able to produce approximately 60,000 tons of ingots monthly with the use of the duplex process."

The report said the proposed installation will provide in the quickest possible time an estimated increase of 42,000 tons of finished steel products monthly.

There's no substitute for SKILL in Steel Making

ANDREWS STEEL

INDUSTRY generally has graduated from "rule of thumb." In today's production, guess work and indecision have given way to scientific control . . . methods have rapidly approached standardization, and precision operation is the accepted and essential procedure.

Yet all the modern, intricate safeguards and robot devices have not displaced the craftsmen, whose steel-making skill still puts in iron and steel products greater value and superior performance.

Andrews is proud of its production facilities and the excellence of its products . . . prouder of the men in plant and laboratory whose years have perpetuated the craftsmanship of fine steel making.

To those who seek quality products and a wholly dependable source of supply, Andrews offers many profitable advantages.

THE ANDREWS STEEL CO.
NEWPORT, KENTUCKY
DIVISIONS
THE NEWPORT ROLLING MILL COMPANY
THE GLOBE IRON ROOFING & CORRUGATING CO.

Data Collected on "Dislocated Tonnage"

Washington

• • • **OPA has asked** steel companies for information by Nov. 25 that will be used in studying the extent to which they have made use of the "dislocated tonnage" provisions of the steel price schedule. Producers have been requested to submit data on net tonnage and dollar value covering shipments under these provisions. Price Administrator Henderson said "there is some indication that the provision has been used to evade the 'ceiling' in the schedule by applying it to ordinary shipments of steel."

As defined by OPA "dislocated tonnage" means steel shipped by producers into areas not customarily served by them. Such shipments are now being required by OPM in order to facilitate progress of the defense program. This in effect, it was pointed out, requires a modification of the basing point system in the steel industry under which the price of steel at a given destination is ordinarily the same regardless of the mill from which it is shipped. This similarity of price is achieved by the more distant mills paying varying portions of the freight charges, depending

Neoprene Output Spurts in 10 years

• • • This month marks the tenth anniversary of the introduction of neoprene, which was introduced at Akron, Ohio, on Nov. 2, 1931. Initial production schedules called for a mere 250 pounds a month, to sell at over $1 per pound. Today approximately 1,500,000 lb. are being produced each month with the price reduced by nearly 50 per cent. Next year monthly production will be still higher.

upon their distance from the customer.

"**Such unusual** shipments of steel required by the defense program would ordinarily require some mills to pay an excessive amount in freight on shipments to distant points," the OPA statement said. "In order to meet this situation, Price Schedule No. 6 was revised by OPA on June 20 to permit the mills to pass on to customers a portion of the freight charge on such "dislocated tonnage" shipped to distant points. OPA intended that this provision should be used only to relieve mills from paying excessive freight charges on such shipments."

The information asked of steel companies is to be broken down into the following categories:

"1. Shipments for which the governing basing point was the established basing point, the use of which results in the lowest delivered price. In those cases the established basing point was that which was nearest freightwise to the consumer.

"2. **Shipments** for which the governing basing point was other than the established basing point the use of which results in the lowest delivered price. In those cases the established basing points was not that which was nearest freightwise to the consumer."

The information is to be based on realized prices at the mill, including "extras, premiums or concessions and any other variable" separately for the months of June and September, 1941. In addition, steel companies were asked to list the names and addresses of all customers to whom "dislocated tonnage" was shipped in each of the two periods.

Allis-Chalmers to Pay $1,000,000 Defense Bonus

Milwaukee

• • • **Allis-Chalmers Mfg. Co.** will pay out over $1,000,000 in defense bonus to its more than 21,000 employees in all plants. Instead of paying the bonus in a lump sum, payment will be made at the rate of 2c. an hour to hourly employees and a comparable adjustment to those on salary. Also, 3c. an hour will be paid for all time and one-half overtime and 4c. for all double time. Plan becomes effective for a 12-month period starting at once and is in addition to the general 5c. an hour increase granted last April. Allis-Chalmers billings for nine months ended Sept. 30, were $86,089,811, the highest in history. Net income was $4,170,793, slightly higher than the same period in 1940 when billings were only $66,543,316.



Bradley Washfountain Installation

In Modern Sanitary Washrooms You'll Find Bradley Washfountains

Adequate sanitary facilities for washing are essential today—to reduce possible infection and to save time.

Bradley Washfountains provide ample facilities,——each serving 8 to 10 persons simultaneously with running water from a central spray-head. The bowl is self-flushing to prevent collection of water and contamination. And it is set low so that it is easy to wash hands and arms—in fact you can wash to the waist.

Bradley Washfountains have been the first choice in industrial plants for many years—installed in practically all new plants and in existing buildings when modernizing and enlarging washroom facilities. They reduce water consumption, save space and time,—and provide the maximum in sanitation.

Our Washroom "Plan Book" with washroom floor plan suggestions will be sent you on request... B R A D L E Y WASHFOUNTAIN CO., 2239 W. Michigan St., Milwaukee, Wis.



BRADLEY WASHFOUNTAINS

Lewis Defies U. S.; Anti-Strike Measure Has Good Chance

Washington

• • • **Seldom has** Washington been as stirred as it is over the captive coal mine strike and its spread to commercial mines. With defense production threatened, the President faced one of the most crucial decisions on a domestic issue that ever confronted him. An angry Congress, bitterly scoring John L. Lewis for his defiance of the government, prepared to push through anti-strike legislation.

The anti-strike bill introduced Monday by Senator Connally of Texas probably stands a better chance for passage than other anti-strike measures. It would permit the government to take over any defense plant where production was interrupted by a strike or other labor disturbances and to freeze the union or non-union status of workers for the duration of the emergency. The bill provides for the appointment of a wage adjustment board which would be authorized to increase the wages of workers in the event of increased living costs.

Collapse of a three-day conference over the union shop in captive mines came last Sunday evening. The failure to avert the strike officially was reported to the President on Monday when it became effective. The conferees, appointed by President Roosevelt, included presidents of three large steel companies, Benjamin F. Fairless, United States Steel Corp., E. G. Grace, Bethlehem Steel Co., and Frank Purnell, Youngstown Sheet & Tube Co., and three representatives of the United Mine Workers Union, President Lewis and District Presidents P. J. Fagan and William Hynes.

At the opening of the White House conference of the steel executives and union representatives last Friday the President told them "frankly that the Government of the United States will not order, nor will Congress pass legislation ordering, a so-called closed shop." Declaring that 95 per cent or more of the employees in the steel company owned captive mines belong to the union, the President emphasized that "the government will never compel this 5 per cent to join the union by a government decree."

In view of these declarations it was not seen how, if it is enacted, the President could decline to sign anti-strike legislation. Indeed it is reported it was only by agreement to such legislation, if the captive coal mine strike conference failed, that the President was able to force a favorable House vote on the neutrality bill. At that it passed the House by the narrow margin of only 18 votes.

The strike marked the fourth defiance of the President by Lewis, who was the first to announce the failure of the conference. He rejected two appeals by the President not to call a strike, he disregarded a third appeal, and finally after collapse of the con-



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60 EAST 42nd STREET, NEW YORK CITY

Furnaces Go Off; Rationing Mapped

• • • Measures for conservation of coal were being mapped at major steel centers Monday and Tuesday following outbreak of the captive mine strike. Stocks generally were low, partly the result of the short stoppage at mines a month earlier.

A Republic Steel Corp. stack at Gadsden, Ala., was the first to go out of blast Monday. Woodward Iron Co. next removed a furnace.

By far the major portion of the nation's steel capacity was jeopardized by the strike. Sympathy walkouts hit a few steel company mines which were not supposed to be affected.

On Monday and Tuesday a large number of loyal workers refused to obey the strike call. Both U. S. Steel Corp. and Bethlehem Steel Co. had hundreds of men working in defiance of John L. Lewis.

ference, he ordered the captive mines struck.

Originally the case went to the National Defense Mediation Board and Lewis ordered resumption of production when steel companies declined to grant a union shop. This truce expired Oct. 22. Lewis again struck the mines Oct. 25 when the board, refusing to recommend an open shop, proposed that both sides submit to recommendation.

Greatly concerned over the loss of defense steel production, the President prevailed upon Lewis Oct. 29 to suspend the strike, and enter into negotiations with Myron C. Taylor, former United States Steel Corp. chairman. These negotiations were proving fruitless and the President asked the board to resume the case and make a specific recommendation on the closed shop issue, Lewis accepting the proposal with the understanding that a decision would be handed down by Nov. 15, but not agreeing to abide by the board's decision.

The decision of the 11-man board was handed down on Nov. 10 and surprisingly enough was 9 to 2 against recommending a closed shop. The two dissenting votes were cast by members of the union involved in the dispute, Philip Murray and Thomas Kennedy, who then resigned.

The mine union's 200-man policy committee at a meeting in Washington gave its unanimous support to Lewis in holding out against signing a new contract unless it contained a union shop clause, in the absence of which he was authorized to call the strike.

At a press conference after the collapse of the negotiations steel executives were asked about a report that they were in disagreement among themselves whether to grant the union shop as a means of preserving peace and assuring uninterrupted production.

"There's only one fundamental issue involved, as you know—the union shop versus the open shop, so far as our companies, respec-

"I WANT THE BEST POSSIBLE JOB— I MUST HAVE A GOOD OIL!!"

"THAT'S WHY I CALLED THE CITIES SERVICE LUBRICATION MAN IN" SAYS A. E. DAVEY, PRESIDENT OF ALLOY STEEL GEAR AND PINION COMPANY OF CHICAGO.

"I'm doing a job here that must be perfect when it leaves the shop. The people who get the gears are plenty critical." Mr. Davey says further, "I don't know everything about oil. That is why I called in the Cities Service Lubrication man. I expect him to work with my men to see that they get the oil best suited for the job."



A. E. Davey

All Gleason, Fellows Gear Shapers, Lee Bradner and Brown & Sharpe machines, are operated with Cities Service Lubricants. You, too, will find these high-quality fluids capable of doing the kind of work your customers want.

Much work in this shop must meet rigid government inspection.

Call us in for consultation — there is no charge for the service. Write us on your letterhead or mail the coupon for a copy of our booklet, "Metal Cutting Lubrication."

CITIES SERVICE OILS — ONCE-ALWAYS — Cutting Oils "SERVICE PROVED"

FREE Just clip and mail

CITIES SERVICE OIL COMPANY
Sixty Wall Tower, Room 1330, New York

Please send me a copy of your booklet, "Metal Cutting Lubrication."

Name.....

Firm Name.....

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City..... State.....

tively, are represented by us," Mr. Fairless said.

"We are undivided in our opposition to a closed shop or union shop."

The steel executives called personally on the President Monday and later in the day sent a written report to him. The report was released by the White House. It expressed regret at the breakdown of the conference but insisted the right to work should not be dependent upon membership or non-membership in any organization.

"The issue in this case," the report said, "concerns one of the fundamental American freedoms —the freedom to work. We firmly and sincerely believe that the right to work in our coal mines, or in other industry, should be dependent upon membership or non-membership in any organization."

The report also told the President that "at no time has there been any difference of opinion among us on this issue."

Lewis not only did not go to the White House to report but issued his report before it was sent to the White House. In it he said he had offered the steel executives the Appalachian commercial mine agreement, which provides for a union shop but that they refused acceptance and offered an open shop agreement.



This is a 2-ton hand-propelled system. Other Cleveland Tramrail equipment is available for either hand or electric operation for loads up to 5 tons.

Courtesy Omaha & Council Bluffs Street Railway Co. Omaha, Neb.

With Cleveland Tramrail it's

EASY PICK-UP
EASY HAUL

A Cleveland Tramrail system like this makes it an easy task to install or remove heavy bus motors. Overhead interlocking transfer bridges permit transportation of the load to the machine shop, some distance away, or to other parts of the building.

Hoist carriers and transfer bridges are smooth, easy operating. Only 15 pounds starting effort and 10 pounds running effort are required per ton load.

Cleveland Tramrail engineers will gladly work with you on your materials handling problems. Write for illustrated booklet 2004-A.

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THE CLEVELAND CRANE & ENGINEERING CO
1115 East 283rd St. Wickliffe, Ohio

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT
Other products: CLEVELAND CRANES and STEELWELD MACHINERY

675,000 Tons of Steel Lost Forever

Pittsburgh

• • • **Hundreds of small** manufacturers whose supply of steel has been drastically reduced or completely cut off could have made good use of approximately 675,000 tons of steel which was permanently lost due to strikes or work stoppages between April 1 and Nov. 1 of this year.

Half of this amount of steel was lost within the past few months. "Outlaw" work stoppages in the steel industry since about the middle of August have numbered approximately 150.

Although this lost tonnage is only a small part of the total steel now being produced, it is significant that many steel customers who have either been driven out of business by priorities or who have had to curtail operations drastically have, during normal times, maintained a full working force with relatively small amounts of steel, running from 2000 to 20,000 tons a year.

Even though additional steel might not have been supplied to these manufacturers, had there been no loss, further reduction in supplies for civilian use has resulted, since national defense must be taken care of and any loss in production, no matter how small, must react against civilian requirements.

In terms of washing machines, ironers, sweepers, autos, etc., 675,000 tons of steel could be stretched out quite substantially. There are many small industries today which are faced with complete shut-downs whose total yearly requirements run not more than 300 or 400 tons of steel.

Effects of Strike Will Be Felt for Months To Come

Pittsburgh

• • • **The mine strike** is expected to have far reaching effects on the defense program for months to come, even though federal intervention or back to work movements may bring about partial resumption of the flow of fuel to the nation's steel mills.

Although hundreds of miners have revolted against John Lewis and have reported for work, many commercial mines covered by the Appalachian agreement were shut down early this week due to outlaw sympathy strikes.

U. S. Steel Corp. captive mines were understood to be partially working early this week in the Western Pennsylvania area and in West Virginia. Ugly situations were being built up by the contemplated movement of strong arm pickets into those areas where mining operations were being continued.

Actual shutdowns at the captive mines, however, are large enough to indicate the banking of several blast furnaces before the end of this week and more severe curtailments, if some relief is not afforded by next week. Supplies of coal at the Carnegie-Illinois Clairton by-product plant are low. Not more than 6 days' normal supply was available early this week. A gradual shutdown of the Clairton plant would affect practically every blast furnace, steel furnace, and finishing mill in the corporation's Pittsburgh plants.

Other steel companies are reported to have coal supplies ranging from 10 days to 3 weeks but mechanical difficulties due to the low stock piles may make these figures too optimistic.

Long after the present strike is settled, the effects will be plainly visible by the disruption of steel mill schedules, lack of sufficient inventories in steel mills to maintain maximum efficiency, and the possibility that next spring industrial coal supplies will be at a dangerously low level.

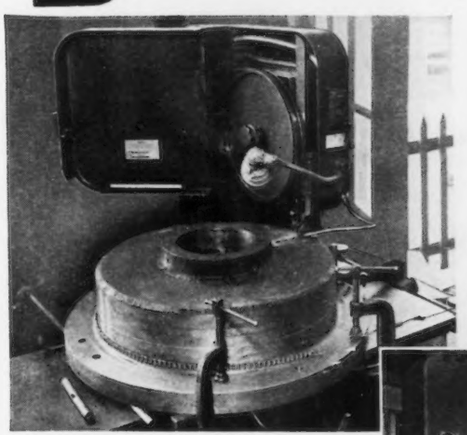
Corporation Plans to Remove 6 Furnaces

• • • **Carnegie - Illinois Steel Corp. issued the following statement Tuesday night regarding the coal strike's effect:**

"During the next 48 hours it will probably be necessary to stop operations at six blast furnaces of Carnegie-Illinois Steel Corp. This will reduce the rate of ingot production by about 10 per cent. This rate may be continued for a week or more, dependent on conditions. Operations after that will depend on the amount of coal mined."

It was understood four stacks were scheduled to go down at Pittsburgh and two at Chicago.

DoAll CUTS WHOPPERS LIKE THIS



1850 POUND DIE

No, it's not a big Wisconsin cheese, but a solid steel die (10" thick, 33" diameter) weighing 500 pounds more than the DoAll Machine on which it was cut in the plant of the Midwest Pipe & Supply Co., St. Louis, Mo.



"GLASS BOOT" DIE PARTS

Here's an assembly die sawed and filed in 90 minutes at the Taylor Instrument plant, Rochester, N. Y. This die makes parts for the famous "glass boot" used in modern hospitals.

FASTEST METHOD OF REMOVING METAL

Makes no difference what it is —aluminum, brass, bronze, copper, iron, steel, nickel, zinc—any kind of metal, alloy or plastic — forgings, castings, tubing, blocks or sheets—the DoAll cuts it with savings of time and metal that are astonishing.

Takes the place of shaper, milling and lathe work on hundreds of different jobs in large and small defense and industrial plants everywhere. In addition to internal and external sawing, the DoAll does band filing and polishing.

IT WILL PAY YOU to have one of our factory trained men call at your plant to show you what a DoAll can save you.



3-OUNCE GASKETS

Cutting gaskets—generally a pain in the neck—is easy with a DoAll. The paper is screwed between two plates, the cut made through the plates, maintaining smooth edges on gaskets.

FREE—Literature and 158-page Handbook on Contour Machining.

DO-ALL Contour Machine BAND SAWING BAND FILING BAND POLISHING

CONTINENTAL MACHINES, INC.

1311 S. Washington Ave. Minneapolis, Minn.

Associated with the DoAll Company, DesPlaines, Ill., Manufacturers of Band Saws and Band Files for DoAll Contour Machines.

Keep Employee Sold, Urges Stilwell at Forum

Cleveland

• • • **A major barrier** that has been placed between employers and employees is the Wagner Act, in the opinion of Charles J. Stilwell, president, Warner & Swasey Co., Cleveland, as expressed before the Labor Relations Forum of the annual meeting of Ohio Chamber of Commerce in Toledo, Nov. 14. Mr. Stilwell contended that it was up to the employer to sell his employee and keep him sold on the integrity of the management. In the face of this he pointed out that the "competition" of the employer in the field of labor relations "declares that employers and employees are enemies; that the interests of employees are of necessity opposed to the interests of employers and that the natural state of affairs between employers and employees is one of economic warfare."

In addition to the Wagner Act, mentioned as a barrier in labor relations, Mr. Stilwell stated that the second major difficulty is "bargaining through outside union offices."

"The motivation for the conduct of the union officer," he said, "may reflect the needs of his own business rather than the sentiments of the employees he is supposed to represent. He may sincerely try to do his best for the men for whom he bargains—but the financial requirements of his business cannot help coloring his approach to the whole subject."

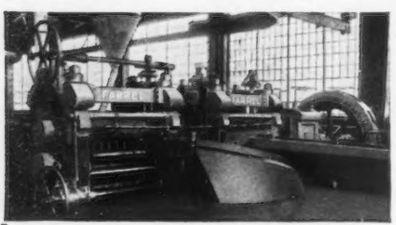
FARREL PRODUCTION UNITS

for

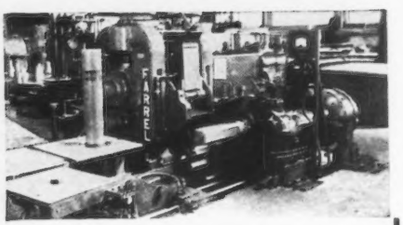
ROLLING MILLS

Farrel Rolling Mills are built in a wide range of sizes, designed for any specific purpose. At right is shown a 20" x 32" Two-High Cold Strip Mill with drive and pinion stand.





We are prepared to design and install complete rod mills from furnace to coilers for any required output. Illustrated are two 20" x 60" Three-High Breaking Down and Roughing Mills with feed table and repeater.



Farrel Constant Tension Reels are made in several types to fit specific requirements. Illustrated is a reel with jaw-type wrapper, stripper and up-ender installed on a brass finishing mill.

Built-in Skill and Ruggedness for Sustained High Output with Precision

The machines illustrated above are typical of Farrel Rolling Mill Equipment built to meet today's urgent demand for sustained high production with uniform precision. Farrel Production Units have many improved features of design and construction which lead to higher operating efficiency, increased output, lower power consumption, minimum labor and maintenance costs and improved quality products.

Farrel Cold Strip Mills are designed for high precision rolling of brass, copper, aluminum, duralumin and other non-ferrous metals and alloys. They are ruggedly built to take heavy passes at high speed and to do it continuously.

Farrel Rod Mills are designed especially to cut power costs and labor handling, to permit the rolling of a diversified product of high quality, and to give sustained high output with minimum scrap.

Farrel Constant Tension Reels are designed to improve strip quality, increase mill output and reduce rolling cost. They provide constant tension under positive control from empty to full reel, keep the metal flat and straight and maintain uniform gauge.

When you have a problem involving the rolling of metals take advantage of the experienced counsel and expert assistance Farrel engineers can give you.

Farrel-Birmingham Rolling Mill Equipment includes: Rolls—Rolling Mills—Rod Mill Tables and Manipulating Equipment—Universal Mill Spindles—Rod Coilers—Lead Presses for Pipe or Rod—Roll Grinding Machines—Roll Calipers—Gears—Mill Pinions—Pinion Stands—Gear Drives of any capacity—Flexible Couplings.

FARREL

FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

Plastics Closely Studied For Replacement Uses

Washington

• • • **The extent to** which plastics can be utilized to replace scarce metals and other critical materials is being studied by the Bureau of Standards in cooperation with the Army, Navy, OPM and other defense agencies.

Emergency specifications have been prepared to utilize plastics in place of scarce metals and essential materials for a long list of articles purchased by the government. These cover a wide range—from vital airplane parts to door knobs.

The research program of the bureau in plastics, undertaken at the request and with the financial support of the Bureau of Aeronautics, Navy Department, and the National Advisory Committee for Aeronautics, includes:

Fabrication of aircraft structures and accessories; improvement of materials used as transparent enclosures on aircraft and the evaluation of new plastics proposed for this application; formulation of airplane dopes to provide coatings which are resistant to fire and to severe weathering conditions encountered in the tropics; and utilization of synthetic resins and cellulose derivatives as coatings to protect airplane structures made of aluminum and magnesium alloys against corrosion by salt water and tropical elements.

Aircraft Production Methods Described in New Book

• • • **Although primarily** designed to acquaint the vocational student and the beginner or young mechanic with the fundamentals of fuselage or airframe production machinery and the underlying theory of their application, the new book, "Machine Tools in Aircraft Production," by R. R. Nolan, should be of value to subcontractors seeking work on aircraft parts. The several chapters on the various types of machines used in sheet metal fabrication are particularly valuable from this point of view, since much of this special machinery is rarely found outside the aircraft industry.

Another valuable chapter contains an analysis of machine tool requirements in terms of short-run and long-run work. The author is superintendent of tooling, Northrop Aircraft, Inc. This little book, which contains 160 pages, is published by the Pitman Publishing Corp., New York.

MRC May Buy Egyptian Low Grade Manganese Ore

• • • **Metal Reserves Co.,** has recently shown some interest in low grade manganese ore. Substantial tonnages of Egyptian ore, running in manganese content from 30 to 35 per cent, have been awaiting shipment for some time from an Egyptian port, and reports this week indicate that MRC is considering purchasing the ore and handling delivery to this country.

Present manganese ore consumption is at the rate of about 900,000 tons per year, while production runs about 600,000 to 700,000 tons per year.

Drum Makers Ordered To Stockpile Steel

• • • **Order M-45** this week instructs barrel makers to reserve an inventory for drums made of 16 or 18 gage hot rolled sheet steel. The order was prompted by increasing shipments of petroleum abroad. At the same time Preference Order P-76 was issued by OPM providing a rating plan for container steel. Reports will be made on PD-156.

General Electric to Build Huge Phenol Plant

• • • **Plans for** construction of a new $1,000,000 plant in Pittsfield, Mass., by the General Electric Co., for the manufacture of synthetic phenol were announced recently by W. H. Milton, Jr., newly appointed manager of the G-E plastics department. This action is being taken at the request of OPM to counteract the shortage of phenol.

Funds Arranged for 2 Sheet & Tube Electrics

Washington

• • • **The construction** of a 60-ton and a 30-ton electric furnace with annual capacity of 120,000 tons of ingots, at the Indiana Harbor, Ind., plant of the Youngstown Sheet & Tube Co., is provided for under a $1,900,000 DPC agreement announced on Monday by the Federal Loan Agency



CLEANING SPEED

Wyandotte M.K. 50, the new solvent for use in power washers, is showing spectacular cleaning results on *many* defense manufacturing jobs.

The need of the times is for speedy and economical cleaning, and Wyandotte M.K. 50 (plus water) in power washers fills the bill to a T.

Wyandotte M.K. 50 cleans *all* metals and will not attack *any* metal —aluminum, magnesium, copper, brass, zinc or cadmium.

It is successfully cleaning airplane motor parts during processing prior to assembling . . . cleaning aluminum castings prior to anodizing . . . cleaning steel stampings and castings after machining and prior to painting and lacquering . . . cleaning brass and aluminum screw machine products . . . cleaning stainless steel after stamping and drawing.

Why not call in your Wyandotte Representative and have him check over your cleaning operations? The chances are he can save you time and money. He may show you a short cut or a new cleaner.

Wyandotte PRODUCTS

Service Representatives in 88 Cities

THE J. B. FORD SALES COMPANY, WYANDOTTE, MICHIGAN

$100,000 Fire at Fort Worth Aircraft Assembly Plant

Fort Worth, Texas

• • • **Property and materials** valued at more than $100,000 were destroyed when a fire broke out in the largest warehouse at the Fort Worth Aircraft Assembly Plant, now under construction by Consolidated Aircraft Co., at Fort Worth Texas. Officials of the Austin Co., general contractor of the construction of the plant, deprecated the possibility that sabotage might have caused the unexplained blaze, but stated that an investigation would begin immediately.

The warehouse, 200 x 50 ft. was used to stock galvanized sheet and other material and equipment used to make part of the 10,000 ft. of air conditioning ducts that go into the new plant. Capt. John H. Anderson, resident engineer in charge for the U. S. Army, stated that some of the metal forming equipment in the building may be salvaged, but an urgent request for such replacements as could be spared from other projects was sent to Army constructing quartermasters shortly after the fire. Shipments of material to replace that lost in the fire is expected to begin in two or three days. The entire loss resulting from the fire will be borne by the government, since such projects are not insured.

U. S. to Hire Women

Springfield, Mass.

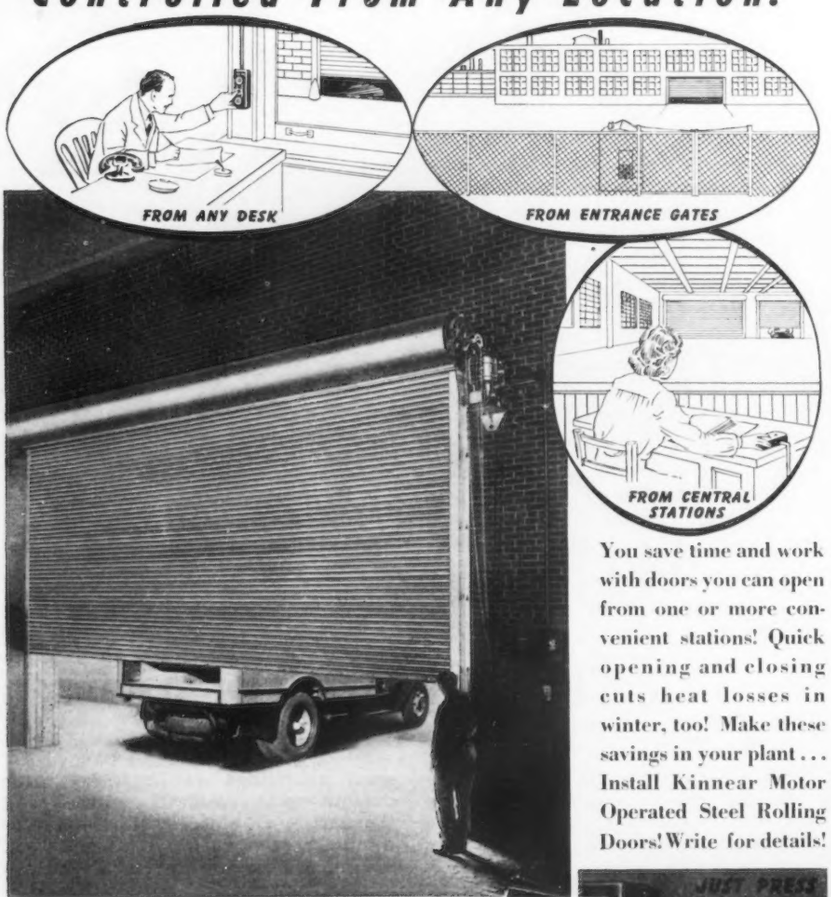
• • • **For the first time** since the World War, the government armory here will hire women for jobs usually filled by men. Fourteen will be selected next week from civil service lists. The armory makes Garand rifles.

MACHINERY FROM ARGENTINA: Miss Dorothy Kimmel (below), export sales manager of Lempco Products Co., Cleveland, says that the importing of machine tools from South America is an emergency phenomenon, likely to be ended in peacetime by a 20 per cent tariff and high shipping charges.

Photo by Wide World



KINNEAR Motor Operated ROLLING DOORS
Controlled From Any Location!



You save time and work with doors you can open from one or more convenient stations! Quick opening and closing cuts heat losses in winter, too! Make these savings in your plant... Install Kinnear Motor Operated Steel Rolling Doors! Write for details!



In addition to remote control, Kinnear Rolling Doors give you extra value in other ways. By coiling compactly above the doorway, they save floor and wall space . . . leave ceilings clear for conveyors . . . avoid blocking off light from above . . . remain out of the way and out of reach of damage . . . and permit full use at all times of all space around openings. Their strong, durable, time-tested interlocking-slat design and all-steel construction afford valuable protection against fire, intrusion, sabotage, wind, and the elements. Easy to install in old or new buildings. Write today for catalog describing many other features! THE KINNEAR MANUFACTURING CO., 1760-80 Fields Avenue, Columbus, Ohio.

SAVING WAYS IN DOORWAYS KINNEAR ROLLING DOORS

Three Alabama Men in Iron and Steel Elected

Birmingham

• • • **Associated Industries of** Alabama Nov. 14 picked as three of its five vice-presidents men who are associated with the iron and steel industry. They are: Warren Whitney, manager, National Cast Iron Pipe Co., Birmingham; J. M. Franklin, vice-president, Central Foundry Co., Holt; William H. Deyo, president, Anniston Foundry Co., Anniston.

Assembly Line

(CONCLUDED FROM PAGE 72)

ably be erected on a site near Whigville, outside Flint, but tank parts will be fabricated at Fisher Body plant No. 1 in Flint, at the Buick Motor Division and by numerous sub-contractors.

Ford will do its tank assembly in the Highland Park plant and will fabricate most of the parts at River Rouge.

Also within the General Motors group, tank production will be handled by Cadillac in Detroit. This division will make the 14-ton light tank and will equip it with two 150-hp. Cadillac engines, possibly with Hydramatic drive. This tank should be a fast, high-performing type when you consider those figures. The 300-hp. will have to move only 14 tons, whereas in the M-3 tank, a 450-hp. airplane type engine must move nearly 30 tons.

DETROIT nearly swallowed its pride when it was reported from Washington that the War Department had rejected 5000 of the new 50-cal. machine guns, inferentially those made by AC Spark Plug division of General Motors. First report, widely disseminated and apparently never denied, said that the guns were rejected because of sub-standard workmanship. The facts appear to be that the workmanship was all right and the guns even better than demanded by specifications. The rejection was a reflection on somebody else, not AC.

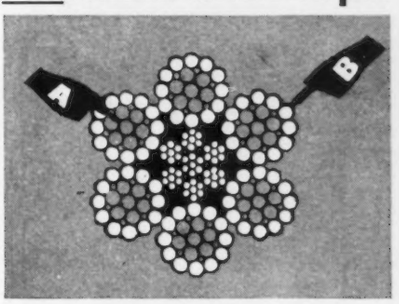
The facts are that the guns were once accepted by the Army and admittedly performed satisfactorily, but that later the Army decided that certain parts were not interchangeable in the field with parts made by other manufacturers. The reason for this is that a change, suggested by AC to facilitate production and accepted by the Army, prevented the interchange of some parts. Under the circumstances, the Army would have done itself a favor if it had acknowledged a mistake and found some other way to have corrected the error, rather than trying to put the onus on the supplier.

Automobile production at mid-November was at a weekly level of 92,990 cars and trucks, compared with 93,585 in the previous week and 123,143 in the corresponding week of last year, according to Ward's Reports, Inc.

Speed up . . . SAFELY!

With this Tested and Proved combination:
CRANE ROPES to hoist the load . . .
SLINGS to harness the load . . .

MACWHYTE PREformed Crane Ropes



. . . made with 2 kinds of wire for EXTRA staying power.

A. Extra Flexible Inner Wires in every Monarch Whyte Strand PREformed rope are improved plow steel . . . specially designed with extra flexibility for service inside the strands.

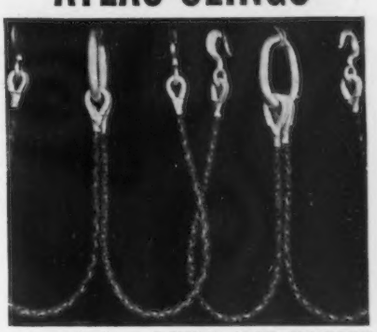
B. Extra Tough Outer Wires in Monarch PREformed are also improved plow steel. They are made with a tough wear-resisting "skin" specially for service on outside strands.

PLUS INTERNAL LUBRICATION . . . which protects unseen, inside wires which are the reserve strength of your rope upon which safety depends.

The CORRECT rope for your equipment — MACWHYTE PREformed CRANE ROPE



MACWHYTE ATLAS SLINGS



. . . made from LEFT-AND-RIGHT LAY Endless Wire Ropes to SPEED Your Loads SAFELY!

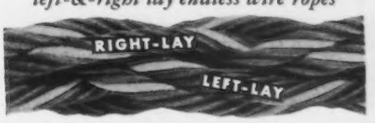
Because they're made of a special construction (patented), Macwhyte Atlas Slings are . . .

Absolutely NON-SPINNING

Extremely flexible, kink-resistant, light-weight, easy to handle, SAFE.

Low Cost Safety, because the left-lay AND right-lay wire ropes work together — a balanced construction with each part carrying its share of the load. Sling Catalog S-6 available by request on your Company letterhead stating title.

Patented, braided body made from left-&-right lay endless wire ropes



MACWHYTE COMPANY, *2911 Fourteenth Avenue, Kenosha, Wisconsin.* Manufacturers of wire rope to meet every need — Left & Right lay Braided Slings — Stainless Steel Wire Rope — Monel Metal Wire Rope — Aircraft Cable, Aircraft Tie Rods, "Safe-Lock" Swaged Terminals. NO. 579

New York · Pittsburgh · Chicago · Ft. Worth · San Francisco · Portland · Seattle · Distributors throughout the U. S. A.

Government Awards . . .

War Dept., Corps of Engineers:

Air Engineers, Inc., Birmingham, Ala.; refrigerators $2,834
Albert & Davidson Pipe Corp., Brooklyn; pipes and fittings ... 18,534
Albina Engine & Machine Works, Portland, Ore.; dry-docking, cleaning, painting and repairing U. S. Seagoing Hopper Dredge "Pacific" 8,354
American Steel & Wire Co. of N. J., Los Angeles; fencing materials for chain link fence 5,510
Aqua Systems, Inc., New York; construction of Gasoline Fueling System, Mines Field, Los Angeles, Cal. 18,090
Atlanta & Saint Andrews Bay Railroad Co., Dothan, Ala.; spur tracks, Tyndall Field, Panama City, Fla. 3,644
Belmont Metal Co., Inc., New York; standard steel buildings.. 40,526
Berger Mfg. Division, Republic Steel Corp., Canton, Ohio; steel shelving, grating, hand railing and stairs 175,200
Bethlehem Steel Export Corp., New York; structural steel I-beams, channels and h-pilings .. 5,154

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Equipment for

GALVANIZING

(Electro Process)

PICKLING

CLEANING

PLATING

At your Service . . . the country's leading practical plating engineers.

ADDRESS:

The MEAKER co.

1635 So. 55th Ave., Chicago

Sam Bissett, Sacramento, Cal.; construction of overhead electrical distribution system, McClellan Field, Sacramento Air Depot, Cal. 4,820
Blaw-Knox Division, Blaw-Knox Co., Birmingham, Ala.; electroforged grating 16,422
Bucyrus-Erie Co., South Milwaukee, Wis.; shovels 54,948
Buffalo Forge Co., Buffalo; baby conoidal fans 2,105
Buffalo Gasoline Motor Co., Buffalo; gasoline-electric standby unit 8,560
Century Fence Co., Waukesha, Wis.; wire fencing, posts and gates 5,722
Chicago Bridge & Iron Co., Birmingham, Ala.; water tank, Gunter Field, Montgomery, Ala. ... 42,985
Chicago Pneumatic Tool Co., Los Angeles; riveters 6,780
Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati; milling machines 9,517
John Dehner, Inc., Ft. Wayne, Ind.; construction of a sanitary sewer system with service connections, Baer Field, Ft. Wayne, Ind. 2,391
Dorr Co., Inc., New York; primary clarifiers, distributors and secondary clarifiers 6,514
W. F. Dougherty & Sons, Inc., Philadelphia; coffee urns and bakers tables 5,829
Dye & Mullings, Inc., Columbia, Miss.; construction of transformer substation, Jackson Air Corps Project, Jackson, Miss. .. 2,860
Edward Ehrbar Co., Brooklyn; jetting & centrifugal pumps ... 8,186
El Paso Iron & Metal Co., El Paso, Texas; galvanized pipe 2,437
Engineering & Equipment Co., Albany, Ga.; plumbing supplies .. 8,757
Fairmont Railway Motors, Inc., Fairmont, Minn.; target cars ... 5,837
Fargo Motor Corp., Detroit; automobiles 8,115
Federal Electric Co., Inc., Chicago; fire alarm sirens 2,055
Forcum - James Co., Dyersburg, Tenn.; construction of earthwork, Lower St. Francis, Upper Yazoo & White River Levee Districts 92,892
Great Lakes Dredge & Dock Co., Chicago, Ill.; dredging, Calumet Branch of the Indiana Harbor Canal 12,495
Hamilton-Huster Machinery Co., Dallas; precision shear and notching machines 5,023
shear and notching machines .. 5,949
Harnischfeger Corp., Milwaukee; shovels, light plants and stoves. 44,594
mechanical shovels 44,594
parts for excavators 4,781
Harrison & Burrowes, Inc., Jersey City, N. J.; raising of Barge Canal Bridge, West Schuyler Road, Herkimer County, N. Y.. 59,767
Hevi-Duty Electric Co., Minneapolis; electric furnaces 25,290
Ingersoll-Rand Co., New York; air compressors, wagon drills, drilling tools and supplies 36,180
portable air compressors 26,030
Kay-Zee Manufacturing Co., Cleveland; coffee urns 29,677
Kewanee Boiler Corp., Kewanee, Ill.; portable firebox steel steam boilers 6,900
Keystone Driller Co., Beaver Falls, Pa.; drilling machines, derrick cranes and tools 15,240
J. M. Kurn and John G. Lonsdale, Trustees, San Francisco Railway Co., St. Louis; construction of railroad spur track, Advanced Twin Engine Flying School, Columbus, Miss. 68,000
Leeds & Northrup Co., Philadelphia; tempering furnaces 4,597
R. G. LeTourneau, Inc., Peoria, Ill.; scrapers, angledozers, power control units and bulldozers. 24,350

C. J. List Construction Co., Kansas City, Mo.; construction of earthwork, Lower St. Francis, Upper Yazoo & White River Levee Districts 35,638
Machine Tool & Supply Co., Tulsa, Okla.; grinders 17,162
Mahoney-Clarke, Inc., New York; wire rope, hose, wrenches, cables, splicing tools, etc. 2,550
nails, rivets, nuts and washers. 5,601
construction equipment 3,693
drill presses and tools 2,310
R. D. Merrill, Helena, Mont.; construction of temporary buildings, Long Beach, Cal., Air Corps Ferrying Command 438,181
Midwest Steel Co., Oklahoma City; fencing, Will Rogers Field, Oklahoma City, Okla. 1,600
Moore-Handley Hardware Co., Birmingham, Ala.; plumbing supplies 5,354
Samuel C. Morris, New York; steam kettles 3,730
Morrison-Knudsen Co., Inc., Los Angeles, Cal.; miscellaneous earthwork and sub-grade preparation, Stockton Airfield, Cal. 231,560
Noland Co., Inc., Montgomery, Ala.; boilers, pumping units and blow-off tanks, generators 6,043
Palma Motor Sales & Service Corp., West Brighton, S. I., N. Y.; station wagons, pick-up trucks, fog lights and heaters 8,944
C. T. Patterson Co., Inc., New Orleans; door & window hardware 2,543
W. H. Peepels Co., Inc., Long Island City, N. Y.; fabricated duct work and grilles 2,448
Pioneer Engineering Works, Inc., Minneapolis; sand and gravel washing, crushing and screening equipment 15,150
repair parts for gravel plant .. 2,805
Pomona Pump Co., Pomona, Cal.; pumping equipment motor driven pumping unit, Susquehanna River Flood Control, Plymouth, Pa. .. 56,918
Quisle and Andrews, Ft. Worth, Tex.; construction of permanent Steam Plant, Duncan Field, Texas 33,489
R-S Products Corp., Philadelphia; furnaces 8,190
Read Machinery Co., Inc., York, Pa.; puree mixers 3,950
Republic Steel Corp., Cleveland; steel reinforcing bars 10,200
H. N. Rodgers & Sons Co., Memphis, Tenn.; construction of earthwork, Lower St. Francis, Upper Yazoo & White River Levee Districts 39,045
Rushton Equipment Co., Birmingham, Ala.; refrigeration machinery and accessories 3,772
Shook & Fletcher Supply Co., Birmingham, Ala.; refrigeration machinery and accessories 3,383
David Smith Steel Co., Inc., Brooklyn; steel bars 3,962
Sterling Motors Corp., Long Island City, N. Y.; dump trucks 45,980
Studebaker Corp., South Bend, Ind.; automobiles 2,652
Taylor-Wharton Iron & Steel Co., Easton, Pa.; oxygen cylinders. 6,528
A. Tiechert & Son, Inc., Sacramento, Cal.; construction of landing strip, runways, taxiways, warm-up apron and appurtenant facilities, Stockton Airfield, Cal. 301,631
Tinius Olsen Testing Machine Co., Philadelphia; universal testing machines 1,850
Uniflow Manufacturing Co., Erie, Pa.; water coolers 2,537
United Clay Products Co., Washington, D. C.; construction of heating and air conditioning system for Combat Command Control Building, Bolling Field, Washington, D. C. 36,325
United Hoisting Co., Inc., New York; single drum hoist 2,125
U. S. Electrical Motors, Inc., Los Angeles; vari-drive aero test stands 4,952
United States Pipe & Foundry Co., Birmingham, Ala.; cast iron pipe 4,793
Webber Motor Car Co., Inc., Westwood, N. J.; trucks and motors. 4,268
Wrought Iron Range Co., St. Louis; ranges 4,654
Yoeman Brothers Co., Chicago; recirculating pumps, digesters, and services of an erection superintendent 3,173
Young & Vann Supply Co., Birmingham, Ala.; pumps 2,322
Zork Hardware Co., El Paso, Texas; galvanized pipe 5,809

War Dept., Air Corps:

Aeroproducts Division, General Motors Corp., Dayton, Ohio; hub and spinner assemblies and propeller blades $106,900



PARISH
STAMPINGS
Travel Light

CARLINE BRACKET—Used for connection between side posts and roof carlines in body frame construction of present type trailers.

Buses, trailers, railroad cars, and all transportation units, earn dividends through light weight construction. This is made possible by using high strength, corrosion resistance stampings.

To witness:—These brackets made by Parish are of .050" Ga. and 3/16" High Tensile Steel. They bring sturdy endurance, increased pay-load capacity to trailers.

Parish engineers can bring an added value to your product. Let us show you how.

PARISH *Specialists in* STAMPINGS *of Distinction*

PARISH PRESSED STEEL CO.
READING, PENNA.
Pacific Coast Representative
F. Somers Peterson Co.,
57 California St.,
San Francisco, California



SPRING BRACKET — For trailer, made of several pressed steel plates welded to form the assembly shown. Lighter and Stronger.

Aro Equipment Corp., Bryan, Ohio; propeller hub assemblies.. 218,325
Bliss & Laughlin, Inc., Buffalo; steel 59,006
Clark Equipment Co., Battle Creek, Mich.; tractors 1,863,552
Crucible Steel Co. of America, New York; steel 120,474
Curtiss-Wright Corp., Curtiss Propeller Division, Caldwell, N. J.; propeller assemblies and spare parts 231,476
propellers, governors & controls. 149,939
parts for airplanes 86,383
Douglas Aircraft Co., Inc., Santa Monica, Cal.; parts for airplanes 177,882
tools & tool kits 434,281
Elgin National Watch Co., Elgin, Ill.; aircraft clocks 172,080
Firestone Tire & Rubber Co., Firestone Steel Products Division, Akron, Ohio; oxygen cylinders.. 830,729
General Motors Corp., Aeroproducts Division, Dayton, Ohio; propeller blade assemblies 725,000
Harrisburg Steel Corp., Harrisburg, Pa.; gas cylinders 94,650
Jacobs Aircraft Engine Co., Pottstown, Pa.; parts for aircraft engines 211,845
Jacobson & Co., Inc., New York; portable engine test houses 534,195
A. C. Lawrence Leather Co., Peabody, Mass.; sheep shearling .. 198,375
Lockheed Aircraft Corp., Burbank, Cal.; parts for airplanes 73,561
Oneida, Limited, Oneida, N. Y.; bomb shackle assemblies 200,626
Platt-LePage Aircraft Co., Eddystone, Pa.; plane equipment ... 144,662
Pump Engineering Service Corp., Cleveland; hydraulic pumps ... 72,765
Reynolds and Reynolds Co., Dayton, Ohio; pages for technical order handbooks 63,375
Sharpsville Steel Fabricators, Inc., Sharpsville, Pa.; tanks and gaskets 955,200
Sparks-Withington Co., Jackson, Mich.; mooring kits and signal assemblies 262,368
airplane equipment assys. 233,851
Steel Products Engineering Co., Springfield, Ohio; machine gun turret assemblies 8,611,416
Thompson Products, Inc., Cleveland; fuel pumps 1,461,075
United States Rubber Co., Detroit, Mich.; casings and inner tubes. 126,180
Weaver Manufacturing Co., Springfield, Ill.; portable engine hoists 261,750
Wright Aeronautical Corp., Paterson, N. J.; tools for engines ... 149,346

War Dept., Chemical Warfare Service:

Allegheny Ludlum Steel Corp., Watervliet, N. Y.; tool steel .. $2,978
Alvey Conveyor Mfg. Co., St. Louis; conveyors 4,408
Bethlehem Steel Corp., Bethlehem, Pa.; coke tinplate 3,639
E. C. Brown Co., Rochester, N. Y.; decontaminating apparatus unit and parts 21,611
Buffalo Foundry & Machine Co., Buffalo, N. Y.; shelf dryer vacuum 906
Caspers Tinplate Co., Chicago; superdraw black plates and prime tin plates 574
Continental Can Co., New York; seats, inlet valve assembly 2,110
steel sheets 1,131
Cooper Tea Packet, Inc., New York; bags, innertube, canister. 1,218
Detroit Hoist & Machine Co., Detroit; electric hoists 650
Diamond Mfg. Co., Wyoming, Pa.; tinplate 16,861
Duriron Co., Dayton, Ohio; acidproof plug valves 1,770
Eureka Vacuum Cleaner Co., Detroit; eyerings 60,273
Fyr-Fyter Co., Dayton, Ohio; decontaminator apparatus 3,603
Lynd Farquhar Co., Boston, Mass.; milling machines 1,824
Charles Mundt & Sons, Jersey City; sheet aluminum alloy 1,606
Precision Fabricators, Inc., Rochester, N. Y.; inlet valve disks ... 12,147
G. E. Prentice Mfg. Co., New Britain, Conn.; hook & eye clasps and loops 9,434
Quality Buckle Co., Pawtucket, R. I.; webstrap buckles 21,143
Revere Copper & Brass, Inc., Rome, N. Y.; sheet brass 349,376
Stanley Works, New Britain, Conn.; webstrap slides 5,000
Stewart-Warner Corp., Chicago; elbow nozzles 40,136
United-Carr Fastener Corp., Cambridge, Mass.; couplers, buttons & washers, plates, sockets, studs, etc. 102,044

War Dept., Signal Corps:

Ampro Corp., Chicago; reels, motion picture $5,600
Anaconda Wire & Cable Co., New York; wire 758,100
Charles Fischer Spring Co., Brooklyn; casings 73,040
General Cable Corp., New York; wire 2,384,859
Graybar Electric Co., New York; cables & reels 13,600
wire 15,121
Joslyn Co., New York; wire 49,960
Okonite Co., Passaic, N. J.; wire. 454
Phelps Dodge Copper Products Co., New York; wire 618
A. J. Ulmer, New York; snaps .. 760
U. S. Rubber Co., New York; wire 180,000
Whitney Blake Co., New Haven, Conn.; wire 231,000

War Dept., Quartermaster Corps:

Anchor Post Fence Co., Baltimore, Md.; fence, Atlanta General Depot, Ga. 51,548
Bauer-Smith Dredging Co., Lavaca, Texas; steel tug 34,900
Corbitt Co., Henderson, N. C.; tractor-trucks 7,942
Doehler Metal Furniture Co., Inc., New York; cots, folding, steel.. 48,300
General Motors Corp., Chevrolet Division, Detroit; trucks 44,509
Harris-Hub Bed & Spring Co., Cicero, Ill.; folding steel cots .. 48,300
Hercules Food Service Equipment, Inc., New York; pans, muffin, retinned 5,266
Logan Company, Inc., Louisville, Ky.; tent stoves 59,625
Motor State Products Co., Ypsilanti, Mich.; cots, folding, steel. 64,152
Rust Engineering Co., Birmingham, Ala.; heat treating buildings, Gadsden Shell Plant, Ala.. 124,053
Simmons Co., New York; cots, folding steel 80,500

You can get **INCREASED PRODUCTION** *from* **KENNAMETAL** *without delay*

Standard tools are shipped *In less than two weeks*

There is no need to wait weeks or months for deliveries of KENNAMETAL steel-cutting tools. Standard and Modified Standard KENNAMETAL tools are shipped within 10 days of receipt of order; Standard tool blanks within 3 to 4 days. Not only does KENNAMETAL enable you to cut machining time on steel parts by as much as 50%, but prompt shipments of tools and blanks permit this increased production ***almost at once.***

Certain widely used standard KENNAMETAL tools (rough ground with Grade KM tips only) are carried in stock for immediate shipment.

DO YOU HAVE A COPY OF THE NEW KENNAMETAL Catalog No. 42? IF NOT, WRITE FOR ONE TODAY.



McKENNA METALS Co.
144 LLOYD AVE., LATROBE, PENNA.
FOREIGN REPRESENTATIVES: U. S. STEEL EXPORT CO.
(Exclusive of Canada, Great Britain and Possessions)

Smith & Davis Mfg. Co., St. Louis; cots, folding steel 80,050

Yellow Truck and Coach Mfg. Co., Pontiac, Mich.: trucks 31,388

War Dept., Medical:

Clauss Shear Co., Fremont, Ohio; scissors $7,915

Gotham Scientific Co. (Joseph J. Oliker), New York; hot air sterilizers, test tube supports and water baths 13,055

Insinger Machine Co., Philadelphia; dish washers 1,395

International Silver Co., Meriden, Conn.; forceps 29,319

J. Sklar Mfg. Co., New York; jaw props, knives, retractors, etc. .. 11,098

War Dept., Coast Artillery Corps:

Hardware & Supply Corp., Kansas City, Mo.; rope, wire, galvanized $3,000

John A. Roebling's Sons Co., Trenton, N. J.; rope, steel, galvanized 16,306

War Dept., Defense Plant Building:

Aviation Manufacturing Corp., Lycoming Division, Williamsport, Pa.; plant & equipment for the manufacture of aircraft engines. $3,714,277

Bendix Aviation Corp., Eclipse Aviation Division and Pioneer Instrument Division; additional plants and equipment at Bendix and East Orange, N. J., Philadelphia, Rochester, N. Y., Laconia, N. H., and Baltimore .. 11,816,000

Bendix Aviation Corp., Scintilla Magneto Division; plant facilities at Philadelphia, and Sidney, N. Y. 645,308

Briggs Mfg. Co., Detroit; machinery and equipment for production of aircraft parts 1,046,143

plant and equipment for mfg. aircraft gun turrets 8,848,542

Clarke Aero-Hydraulics, Inc., Pasadena, Cal.; machinery and equipment for mfg. hydraulic components for aircraft 87,536

Eaton Mfg. Co., Wilcox-Rich Division, Saginaw, Mich.; plant and equipment for mfg. aircraft parts 465,235

General Motors Corp., Fisher Body Division, Memphis, Tenn.; machinery and equipment for the manufacture of airplane parts.. 340,530

Guiberson Diesel Engine Co., Garland, Tex.; plant for the manufacture of tank engines 2,411,096

Holley Carburetor Co., Detroit; machinery and equipment for the manufacture of carburetors. 98,708

Hughes Tool Co., Houston; machinery and equipment for the manufacture of airplane parts.. 17,760

Jacobs Aircraft Engine Co., Pottstown, Pa.; plant and machinery 13,077,727

Niles-Bement-Pond Co., Pratt & Whitney Division, West Hartford, Conn.; facilities for the manufacture of machine tools .. 405,000

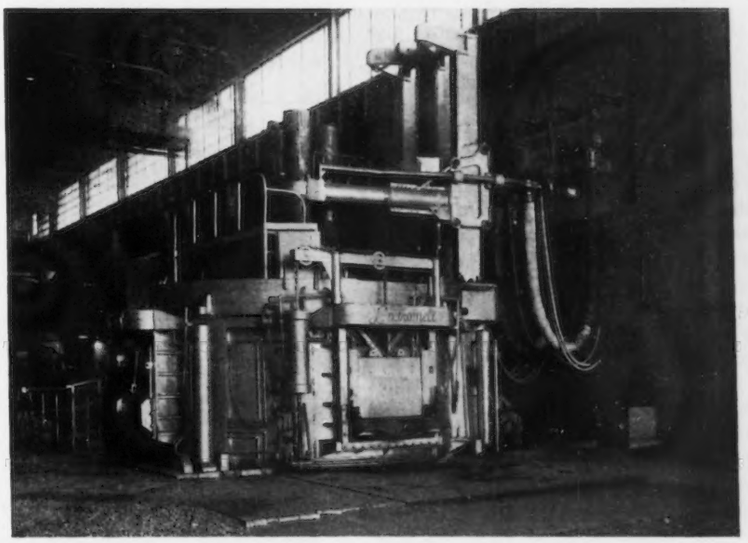
Singer Mfg. Co., Elizabeth, N. J.; acquisition of additional machinery, equipment and durable tools for production of fire control equipment 2,500,000

Southern Aircraft Corp., Garland, Tex.; additional plant facilities for manufacture of aircraft gun turrets 248,794



32% SELF-SUFFICIENT: This foundry of the Pontiac Motor Co. is 32 per cent self-sufficient so far as scrap supplies are concerned, and will provide, from its own operations, 70,000 tons of its 200,000-ton schedule for this year. Photograph shows charging of iron and steel briquettes and a rejected cylinder block. Also visible in background are bales of steel shavings.

THE LARGEST TOP CHARGE ELECTRIC FURNACE IN THE UNITED STATES



LECTROMELT furnaces are built in sizes ranging from 100 tons to 25 pounds. Both door charge and top charge types are available. Rugged and durable construction. Rapid and economic operation.

PITTSBURGH LECTROMELT FURNACE CORP.

PITTSBURGH, PA.

PERSONALS . . .

• **C. M. Kaltwasser** has been appointed vice-president and general manager of Fleetwings, Inc., Bristol, Pa. A graduate of Stevens Institute of Technology with a mechanical engineering degree, Mr. Kaltwasser served as vice-president and general manager of the Lockport, N. Y., Light, Heat & Power Co. and the Harrisburg, Pa., Light & Power Co. Leaving the utility field in 1919, he became vice-president and general manager of the Salisbury Axle Co., Jamestown, N. Y. Before joining the Stinson Aircraft division of Vultee Aircraft, Inc., as general manager, he held executive positions in various automotive parts companies.

• **H. T. Florence** has been named vice-president of the Cleveland Crane & Engineering Co., Wickliffe, Ohio. This position is in addition to his present capacity of general manager. Mr. Florence has served with the company for 20 years in various shop departments, engineering and sales.

• **Alva W. Phelps,** former general manager of the Saginaw Steering Gear division of General Motors Corp., Saginaw, Mich., has been promoted to the position of assistant general manager of the Electro-Motive Corp., LaGrange, Ill. Mr. Phelps will be succeeded as chief executive of the Steering Gear division by **William H. Doerfner,** who has served as Malleable Iron division general manager for the past three years. **James H. Smith,** heretofore works manager of the Malleable Iron division, has been named to replace Mr. Doerfner as general manager. **Samuel W. Healy** becomes works manager.

• **Harry Wilson, Jr.,** works manager of the Jessop Steel Co., Washington, Pa., has been made vice-president in charge of operations. Mr. Wilson joined the Jessop Steel Co. in 1905. He worked in the chemical laboratory, then in the crucible melting department, and finally in the sheet mill division. He was made works manager in 1931. Mr. Wilson is the fifth direct descendant of the Wilson family who have worked continuously for the Jessop Steel Co., and the parent company in Sheffield, England, since 1774.



C. M. KALTWASSER, vice-president and general manager of Fleetwings, Inc., Bristol, Pa.

R. J. Murray, secretary, of the Jessop Steel Co., has been elected assistant treasurer. Mr. Murray joined the Jessop Steel Co. in 1925 after graduating from Lafayette College and worked in the order, production, sales and purchasing departments. He was appointed assistant secretary in 1929 and secretary in 1934.



H. T. FLORENCE, vice-president, Cleveland Crane & Engineering Co., Wickliffe, Ohio.

• **A. A. Bull** has been elected president of the Michigan Wire Cloth Co., Detroit. Mr. Bull was formerly president of Handy Governor Corp., and is now a director of the King-Seeley Corp. Other new officers of the wire cloth company are: **S. W. Farnsworth,** treasurer, and **Harold A. Wilson,** company employee for the past 17 years, vice-president and general manager.

• **David A. Uebelacker,** present chief of the nickel branch of the OPM's materials division, has been named chief of the copper branch, succeeding **John A. Church.** Mr. Church becomes senior consultant for the copper branch. **Louis Jordan,** assistant chief of the nickel branch, has been appointed acting chief.

Howard C. Sykes, present chief of the mica, graphite branch, becomes chief of the stockpile and shipping imports branch, succeeding **Philo W. Parker,** who has served his agreed term in the OPM and is returning to private business. **Howard F. Wierum,** assistant chief under Mr. Sykes, replaces him as chief.

• **L. E. Osborne,** former manager of manufacturing and engineering of the merchandising division of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed assistant to the president in charge of the company's national defense subcontracting program. Mr. Osborne was granted a leave of absence by Westinghouse last January to join the staff of the Defense Commission in Washington. Prior to his new Westinghouse assignment, he served as chief of the heavy ordnance section in the production division of the OPM.

• **H. D. Kelsey,** engineer of the air conditioning and commercial refrigeration department of the General Electric Co., Bloomfield, N. J., has been transferred for the duration of the national defense emergency to the supercharger engineering department. His new duties will take him first to the Lynn River Works plant and later to the new G-E supercharger plant at Fort Wayne, Ind. Mr. Kelsey first joined General Electric in 1919 as a student engineer, and

has held positions in the turbine, compressor and air conditioning engineering departments of the company.

F. T. Grothouse has been named engineer in charge of the air conditioning and commercial refrigeration plant in Fort Wayne, and **D. W. McLenegan** has been made engineer-in-charge at the Bloomfield Works.

• **Leslie C. Allman,** vice-president, and **Elmer G. Gove,** treasurer, have been elected to the board of the Fruehauf Trailer Co.

• **W. W. Nichols,** assistant to the president of the Allis-Chalmers Mfg. Co., Milwaukee, who was awarded a 50-year certificate at the annual luncheon of the National Electrical Manufacturers' Association in New York, has been with the company since 1904 and for many years has devoted his time to the study of executive management.

• **George P. Herrington** has been appointed sales and engineering representative of the Lord Mfg. Co., Erie, Pa., for the Midwest. His headquarters will be at 844 North Rush Street, Chicago, Ill.

• **Marvin W. Davis** has been appointed sales manager of the Suprex Gage Co., Pleasant Ridge, Detroit. Mr. Davis has been actively associated in the standardization, manufacture and sale of metal working gages for the past 23 years. He had been previously connected with the Studebaker Corp. as assistant to the spervisor of inspection in the methods and standards department, the Sheffield Co. as sales manager and with the Taft-Pierce Mfg. Co. as Detroit sales manager.

• **H. A. Schirmer** has been appointed contracting manager, San Francisco district, fabricated steel construction division, Bethlehem Steel Co., with offices at the Alameda, Cal., works. **I. F. Kurtz** is now manager, Alameda, Cal., works of the fabricated steel construction division. Both men succeed the late A. B. Chalton, who held the combined position. Mr. Schirmer was formerly district engineer, San Francisco district, and Mr. Kurtz was assistant works manager.

• **H. E. Merrill,** heretofore advertising manager of the General Electric construction materials division, Bridgeport, has been appointed to the new post of product promotion manager. Mr. Merrill joined General Electric at Bridgeport in 1930, becoming manager of construction materials advertising in 1937. He is succeeded by **Andrew Doremus** who was formerly assistant to Mr. Merrill.

• **Thomas D. Hogg** has been named factory manager of the Chandler-Evans Corp., Meriden, Conn. Mr. Hogg was in charge of experimental work at Chandler-Groves Corp. in Detroit on the famous de-icing carburetor that carried his name in 1935, and took charge of the aircraft carburetor manufacturing department of Holley Carburetor Co. in 1937. He rejoined Chandler in 1939, when the plant moved from Detroit and changed its name.

• **Leonard C. Peskin** has been appointed director of spring mill products, collaborating with the sales department on processes and products of American Steel & Wire Co., Cleveland, a subsidiary of U. S. Steel Corp. Mr. Peskin has been associated with American Steel & Wire since 1934, and is a graduate of Massachusetts Institute of Technology, where he obtained his bachelor's, master's and doctor's degrees. He also served successively as student assistant, part-time instructor and full-time instructor at M.I.T. before becoming associated with American Steel & Wire Co.

• **Manly B. Brown** has been appointed manager of sales, pipe division, Republic Steel Corp., Cleveland, having been assistant manager of that division since he joined Republic in 1936. He was formerly associated with Wilson & Bennett Mfg. Co. as eastern sales manager, and prior to that, was Chicago representative of the Ohio Corrugating Co., following eight years in the Chicago sales department of Wheeling Steel Corp.

• **James C. De Haven** has been named to the technical staff at Battelle Memorial Institute, Columbus, Ohio, where he has been assigned to the division of foundry research. Mr. De Haven is a graduate of Dartmouth College and the Carnegie Institute of Technology. Prior to joining the Battelle staff he was for six years associated with the American Radiator & Standard Sanitary Corp., at Pittsburgh.

OBITUARY . . .

• **August P. Munning** died Oct. 29 aged 68 years. Mr. Munning entered the electrical industry in 1888 when he went with the Leonard Izard Co., agents for the original Edison Co. He then joined the Cutler Hammer Mfg. Co. of Milwaukee, where be became general sales manager. In 1911, he entered the electroplating equipment and supply business, organizing the Munning Loeb Co. of Matawan, N. J., which became A. P. Munning & Co. in 1918. This company was merged with the Hanson & Van Winkle Co. in 1927 to form Hanson-Van Winkle-Munning Co., with Mr. Munning as chairman of the board. He retained this post until his retirement in 1935 but returned to the company a few years later as a member of the executive committee. He again retired in 1940 to become president of the Matawan Bank.

• **Edward Ver Linden,** once a vice-president of General Motors Corp. and a former president of three other automobile companies, died of a heart ailment Nov. 9 at Grosse Pointe Park, Mich. He was 72 years old. Mr. Ver Linden began his career in industry when he was 13 years old, as a machinist apprentice. In 1901 he joined the Ford Motor Co. as foreman and left a year later to become foreman and superintendent of the Detroit plant of the American Radiator Co. In 1906 he became vice-president and superintendent of the Michigan Auto Parts factory. In 1910 be became master mechanic of Buick at Flint, Mich., and two years later became works manager of the Olds Motor Works in Lansing. Successively he became general manager of Olds and finally president. When General Motors took over the Olds factory he became vice-president and a director of the corporation. Subsequently Mr. Ver Linden was president of Durant Motors in Lansing. In 1925 he became president of the Peerless Motor Car Co. in Cleveland, remaining with Peerless until 1928. Then he became an executive of Jordan Motors and returned to Detroit to organize a gasoline and oil distributing company, the Central Service Co., of which he was president at the time of his death.

CONSTRUCTION STEEL

. . . STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Lettings drop to 13,950 tons from 44,450 tons last week; new projects are slightly lower at 16,700 tons; plate awards total 9115 tons.

NORTH ATLANTIC STATES
AWARDS

550 Tons, Blasdell, N. Y., manufacturing buildings for Exolon Co., to Buffalo Structural Steel Corp., Buffalo.

262 Tons, Chemung and Steuben Counties, N. Y., highway bridge, to American Bridge Co., Pittsburgh.

200 Tons, Pittsfield, Mass., General Electric Co. extension to building No. 14, to unnamed fabricator.

154 Tons, Washington, Tidal Basin bridge, to American Bridge Co., Pittsburgh.

132 Tons, Springfield, Mass., manufacturing building for American Bosch Corp., to American Bridge Co., Pittsburgh.

110 Tons, Long Island City, N. Y., laundry building, Sunnyside Yard, for Pennsylvania Railroad Co., to American Bridge Co., Pittsburgh.

110 Tons, Ramapo, N. Y., junior and senior high school, to Dreier Structural Steel Co., New York.

THE SOUTH

1550 Tons, Glen Lyn, Va., power house extention for Appalachian Electric Power Co., to Lehigh Structural Steel Co., Allentown, Pa.

541 Tons, Pottawatomie County, Okla., bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

306 Tons, Havelock, N. C., power house for Rural Electrification Administration, to Ingalls Iron Works Co., Pittsburgh plant.

223 Tons, Grant County, Okla., bridge, to J. B. Klein Iron & Foundry Co., Oklahoma City.

CENTRAL STATES

2500 Tons, Detroit, gun turret plant for Briggs Mfg. Co., to Whitehead & Kales Co., Detroit.

2100 Tons, Massillon, Ohio, bridge superstructure for Massillon conservation project, to Fort Pitt Bridge Works Co., Massillon.

1800 Tons, Mishawaka, Ind., power house for Indiana & Michigan Gas and Electric Service Corp., to Virginia Bridge Co., Roanoke, Va.

600 Tons, Cincinnati, buildings for Cincinnati-Bickford Co., to Fort Pitt Bridge Works Co., through Austin Co., Cleveland.

168 Tons, Pittsburg, Kan., highway bridge, for govt., Jayhawk Ordnance Works, to American Bridge Co., Pittsburgh.

137 Tons, Waterloo, Iowa, Rath Packing Co., to Des Moines Steel Co., Des Moines, Iowa.

WESTERN STATES

1000 Tons, Burbank, Cal., Vega Airplane Co. buildings 82 and 83, to Consolidated Steel Corp., Los Angeles.

600 Tons, Los Angeles, United States Rubber Co. plant addition, to Consolidated Steel Corp., Los Angeles; Engineers' Limited, Los Angeles, contractor.

450 Tons, Pit River, Cal., Pacific Gas & Electric Co. power house No. 5, to Bethlehem Steel Co., San Francisco.

265 Tons, Oakland, Cal., government transit shed, building No. 223, to American Bridge Co., Pittsburgh.

135 Tons, Los Angeles, Western Gear Works plant building, to Pacific Iron & Steel Co., Los Angeles.

PENDING STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

2900 Tons, Boston, Navy Yard, extension to building No. 199.

1200 Tons, Westerly, R. I., Narragansett Electric Co. power house.

965 Tons, Snyder County, Pa., highway bridge; bids Dec. 12.

300 Tons, Portsmouth, N. H., Navy Yard, machine shop.

270 Tons, Hagerstown, Md., hangar for Fairchild Corp.

265 Tons, Aliquippa, Pa., auditorium for Board of Education.

240 Tons, Stamford, Conn., sewage treatment plant.

210 Tons, West Lynn, Mass., building No. 42-M for General Electric Co.

210 Tons, Monroe County, Pa., highway bridge; bids Dec. 12.

170 Tons, Kearny, N. J., four outriggers for Tietjen & Lang Co.

155 Tons, New York, stores terminal building for Pennsylvania Railroad Co.

THE SOUTH

145 Tons, Ranger, N. C., beam bridge for TVA.

CENTRAL STATES

430 Tons, Mansfield, Ohio, addition to building X-14 for Westinghouse Electric & Mfg. Co.

128 Tons, Licking County, Ohio, Licking River State bridge.

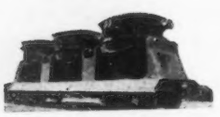
WESTERN STATES

3600 Tons, Fort Peck, Mont., dam; bids Dec. 12 by U. S. Engineer Office, Kansas City, Mo.

OVER 75 TYPES

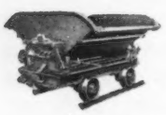
KOPPEL

















INDUSTRIAL CARS

TO HELP YOU

CUT HAULAGE COSTS
SPEED UP OPERATIONS
INCREASE PRODUCTION

Choose your cars from the widely diversified Koppel line of over 75 specific types of Industrial Cars, and you'll be sure of top haulage efficiency with rock bottom maintenance. Get all these advantages, —specify Koppel!

- High Pay Load Capacity.
- Quick, Clean Dumping Action.
- Rugged Durability.
- Minimum Maintenance Per Ton.
- High Tensile and Abrasive Resistant Steel Construction when Desired.

KOPPEL

Do you have our Bulletin 71 on file?

PRESSED STEEL CAR COMPANY, INC.
(KOPPEL DIVISION)
PITTSBURGH, PA.

2850 **Tons,** Hill Field, Utah, airplane repair shop, unit No. 2, for War Department.
1000 **Tons,** Las Vegas, Nev., transmission line towers for Basic Magnesium, Inc.
136 **Tons,** Boulder City, Nev., bus structure extension (Specification 1583-B); American Bridge Co., Denver, low bidder.
110 **Tons,** Cisco, Utah, girder span for Denver & Rio Grande Western Railroad Co.

HAWAII

5000 **Tons** or more, Pearl Harbor, dry dock, power plant, moorings and Navy yard facilities; Pacific Bridge Co., San Francisco, contractor.

FABRICATED PLATES

AWARDS

7800 **Tons,** Las Vegas, Nev., 40-in. water pipe for Basic Magnesium, Inc., to Youngstown Sheet & Tube Co., Youngstown, Ohio.
513 **Tons,** Wilmington, Del., hatch covers for cargo boats for Pusey & Jones Corp., to James G. Heggie & Sons, Joliet, Ill.

PUERTO RICO

800 **Tons,** three gasoline storage tanks, to Bethlehem Steel Co., Bethlehem, Pa.

PENDING PROJECTS

900 **Tons,** Richmond, Cal., pressure vessels.

STEEL PILING

PENDING PROJECTS

1500 **Tons,** South Boston, cruiser dry dock No. 4, two piers and two pump houses.

Reinforcing Steel

Awards of 2825 tons; 21,550 tons in new projects.

AWARDS

ATLANTIC STATES

300 **Tons,** Finderne, N. J., Singer Mfg. Co. factory, to Bethlehem Steel Co., Bethlehem, Pa.
133 **Tons,** Niagara Falls, N. Y., Bell Aircraft Corp. building, to Truscon Steel Co., Youngstown, through Austin Co., Cleveland.

THE SOUTH

370 **Tons,** Carroll County, Ky., State highway bridge, to Laclede Steel Co., St. Louis, Massman Construction Co., contractor.

CENTRAL STATES

850 **Tons,** Youngstown, Ohio, blast furnace for Republic Steel Corp., to Truscon Steel Co., Youngstown, through Shutrump & Sons.
400 **Tons,** Wichita, Kan., Boeing Aircraft plant addition, to Sheffield Steel Co., Kansas City, Mo.
170 **Tons,** Wayne County, Mich., hangar, Ford Motor Co., to Bethlehem Steel Co., Bethlehem, Pa.; Bryant & Detwiler, contractors.
100 **Tons,** Augusta, Mo., housing project, to Bethlehem Steel Co., Bethlehem, Pa.

WESTERN STATES

350 **Tons,** Los Angeles, flood control at Sawtelle and Westwood, to Ceco Steel Products Co., Los Angeles.
140 **Tons,** Torrance, Cal., National Supply Co. plant addition, to Soule Steel Co., Los Angeles.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

5400 **Tons,** South Boston, cruiser dry dock No. 4, two piers, two pump houses and storehouse.
200 **Tons,** New London, Conn., Coast Guard hospital and boat house.
150 **Tons,** Watertown, Mass., arsenal laboratory.

THE SOUTH

3000 **Tons,** Hinton, W. Va., Blue Stone reservoir.
2000 **Tons,** Arlington, Va., Georgetown Corp. hotel.
700 **Tons,** Glen Lyn, Va., Appalachian Electric Power Co.

CENTRAL STATES

8000 **Tons,** Wahoo, Neb., shell loading plant.
160 **Tons,** Lincoln, Ill., bridge over Salt Creek.

Weekly Bookings of Construction Steel

Week Ended →	Nov. 18, 1941	Nov. 11, 1941	Oct. 21, 1941	Nov. 19, 1940	Year to Date 1941	Year to Date 1940
Fabricated structural steel awards	13,950	44,450	25,500	22,725	1,188,420	1,034,136
Fabricated plate awards	9,115	5,465	200	2,600	135,220	135,600
Sheet steel piling awards	0	0	0	0	26,760	65,180
Reinforcing bar awards	2,825	19,800	13,250	11,860	658,105	424,045
Total letting of Construction Steel	25,890	69,715	38,950	37,185	2,008,505	1,658,961

150 **Tons,** Milwaukee, Allis-Chalmers supercharger plant.
100 **Tons,** Chicago, superstructure, south district filtration plant.

WESTERN STATES

700 **Tons,** Las Vegas, Nev., Basic Magnesium, Inc. plant.
447 **Tons,** San Diego, Cal., State highway bridge; bids Dec. 4.
368 **Tons,** Odair, Wash., Grand Coulee power plant, left power house (Invitation D-38, 158-A-1); bids taken.
162 **Tons,** Issaquah, Wash., State highway bridges; bids Nov. 25.

Here's one of the toughest **Munitions Broaching Jobs** *Made Easier with* **Stuart's Thred Kut**
PAT'D U. S. PATENT OFFICE



90 mm. Anti-Aircraft Breech Ring

• Above is shown the set of 14 broaches used to broach the 90 mm. anti-aircraft gun breech ring. 28 cuts are taken to remove 230 cubic inches of material. One part of the square hole has a 1¼° taper. Squareness, size and taper are held to an accuracy of .0015".

THIS is another example of a difficult metal working problem made easier with Stuart's Thred-Kut. These 1,000 lb. breech rings are broached on the largest broaching set-up ever developed by Lapoint Machine Tool Co. It was natural to put Stuart's Thred-Kut on the job because of its proved performance and wide use in armories, arsenals, aircraft plants and other related industries where *nothing less than the best* cutting fluid can serve.

For tapping, threading, deep drilling, broaching, gear cutting and all alloy steel machining operations — use Stuart's Thred-Kut! You'll save time, money and headaches. Write . . . wire . . . phone for a trial drum today.

REMEMBER: the cost of cutting fluids is measured by pennies—the cost of tools and production by dollars!



For All Cutting Fluid Problems
D. A. STUART OIL CO.
Chicago, U.S.A. • LIMITED • Est. 1865
Warehouses in All Principal Metal Working Centers

Cast Iron Pipe

Providence, R. I., has awarded 325 tons of 6-in. and 75 tons of 8-in. class B pipe to Warren Foundry & Pipe Corp., Boston, at $56.80.

Manchester, Conn., has plans for water system improvements to cost $125,000, which have been approved by WPA. Work will start as soon as pipe deliveries are available, and weather conditions permit.

Regional FWA Office, Alaska Building, Seattle, asks bids closing on or about Dec. 1 for second unit of pipe line system for Public Water District in vicinity of Louise, American and Steilacoom Lakes, near Tacoma, Wash., now known as Pierce County Fire District No. 2, comprising 15,000 ft. of 12-in. pipe, 10,000 ft. of 10-in., 28,000 ft. of 8-in., 80,000 ft. of 6-in., 54,000 ft. of 4-in., and 11,000 ft. of 2-in., with valves, valve boxes and other accessories. Parker & Hill, Smith Tower Building, Seattle, are consulting engineers.

Agency, Iowa, plans about 15,000 ft. of pipe, various sizes, for water system. Also 30,000-gal. elevated steel tank on 1100-ft. steel tower and other waterworks equipment. Ralph W. Gearhart, 349 Twenty-first Street, S. E., Cedar Rapids, Iowa, is consulting engineer. Cost close to $40,000.

Fayetteville, N. C., has plans for pipe line extensions and improvements in water system. Cost about $220,000; also will build new water treatment plant, estimated at $242,000. Financing in amount noted has been arranged through Federal aid. William C. Olsen, Raleigh Building & Loan Building, Raleigh, N. C., is consulting engineer.

Starke, Fla., plans pipe line extensions in water system and other waterworks installation. Cost about $149,000. Financing will be arranged through Federal aid.

Fresno, Cal., has awarded 6000 ft. of 4-in. pipe, 10,000 ft. of 6-in., and 5500 ft. of 8-in. to United States Pipe & Foundry Co., San Francisco.

Pipe Lines

Rogers Lacy, Longview, Tex., oil operator, plans new 8-in. welded steel pipe line from Gladewater, Tex., to east Texas oil field, close to 40 miles, for crude oil transmission. Connection will be made at Gladewater with recently acquired pipe line extending from that point to Kilgore, where bulk oil terminal is located. Company also plans new steel pipe line gathering system at Hawkins oil field district, Wood County, for increased supply from that area. Cost over $200,000.

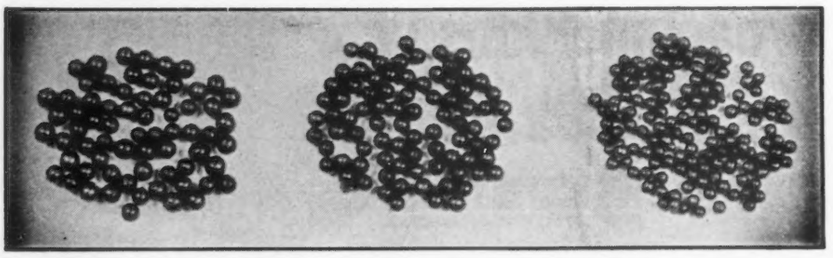
Iroquois Gas Corp., Iroquois Building, Buffalo, plans extensions in pressure pipe line system for natural gas transmission to Sardinia, N. Y., and vicinity, where service will be furnished, including local distribution lines, control station and other operating facilities.

United States Engineer Office, Post Office and Custom House, St. Paul, Minn., asks bids until Nov. 25 for steel pontoon pipe, hull discharge pipe, suction pipe, etc.; also for pontoon pipe parts, valves, suction pipe parts, and fittings (Circular 28).

Metropolitan Utilities District, Eighteenth and Harney Streets, Omaha, Neb., plans pressure pipe line system for gas supply in district No. 920, near Washington Street, recently created.

Panhandle Eastern Pipe Line Co., 1223 Baltimore Street, Kansas City, Mo., plans extensions in welded steel pipe lines in southern Michigan for natural gas transmission to Kalamazoo, Pontiac, Flint, Battle Creek and other municipalities, at estimated cost of $6,800,000. Company is concluding arrangements for acquisition of Michigan Gas Transmission Corp., Detroit, and will consolidate lines with its system in State. Also will purchase Indiana Gas Distribution Corp., and other certain pipe lines in Indiana and Ohio, heretofore owned and operated by Ohio Fuel Gas Co., Cleveland, and will make extensions for connection with main natural gas transmission system. Company recently authorized a total of about 245 miles of welded steel pipe lines for main system from Panhandle gas field area, including loops for increased transmission, with compressor stations and other operating facilities. Financing in amount of $25,000,000 is being arranged through sale of bonds and preferred stock, a considerable part of fund to be used for purposes noted, including approximately $11,281,000 for acquisition of existing pipe line systems mentioned.

Tennessee Gas & Transmission Co., Chattanooga Bank Building, Chattanooga, Tenn., Curtis B. Gall, head, plans to begin construction next spring on new 16 and 20-in. welded steel pipe line from gas field in Louisiana to Alcoa, Tenn., and vicinity, for natural gas transmission. As previously noted in these columns, company has contracted to furnish natural gas requirements for plant of Aluminum Co. of America, Inc., at last noted place; service also will be furnished at other points in State, as well as in Northern Mississippi and northern Alabama. Line will be about 800 miles long and is estimated to cost approximately $20,000,000 with booster stations, meter houses and other operating facilities. Financing is being arranged.



HEAT-TREATED STEEL SHOT

We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

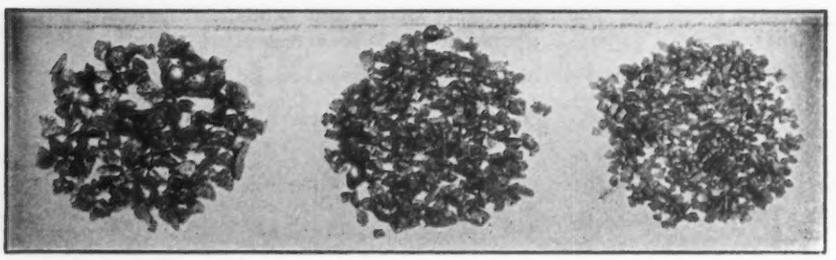
Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

HARRISON ABRASIVE CORPORATION

MANCHESTER, NEW HAMPSHIRE

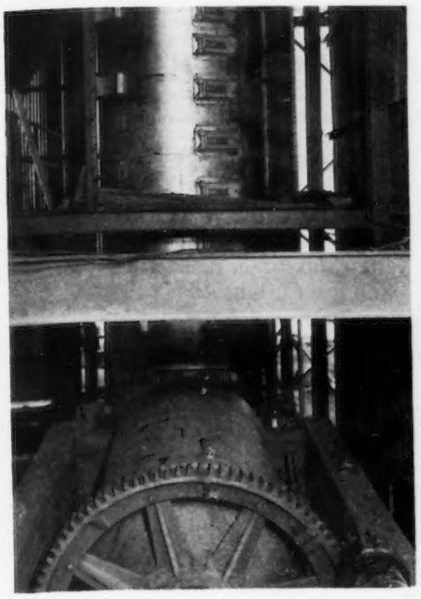
HEAT-TREATED STEEL GRIT

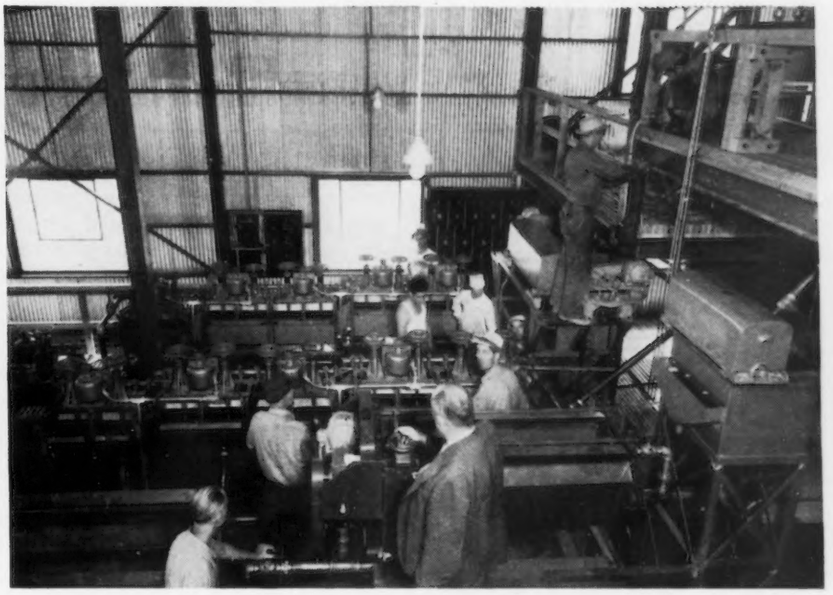


50,000 Tons of Scrap Reported in Hawaii

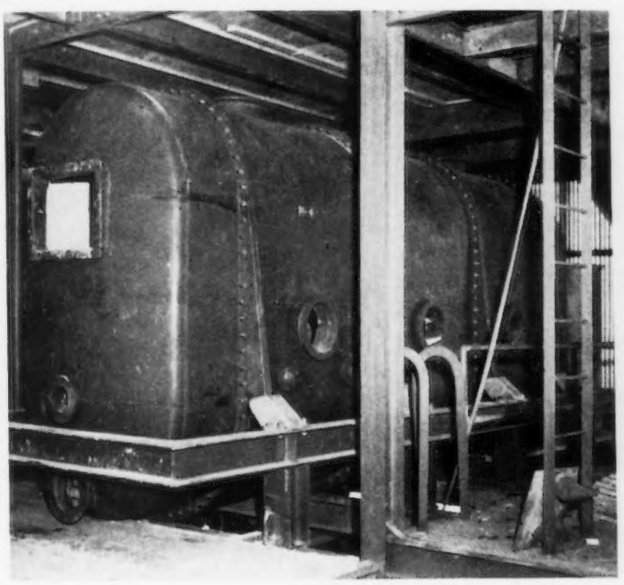
• • • **The recent relaxation** of the scrap steel price ceiling to permit importation of scrap from foreign countries will probably add but little to the U. S. supply of scrap for the reason that very little scrap is available outside the U. S., according to the Department of Commerce. The department estimates that the largest tonnage, running between 50,000 and 70,000 tons, is located in Hawaii. The amount available from all other outside sources available for tapping is believed to amount to less than 50,000 tons.

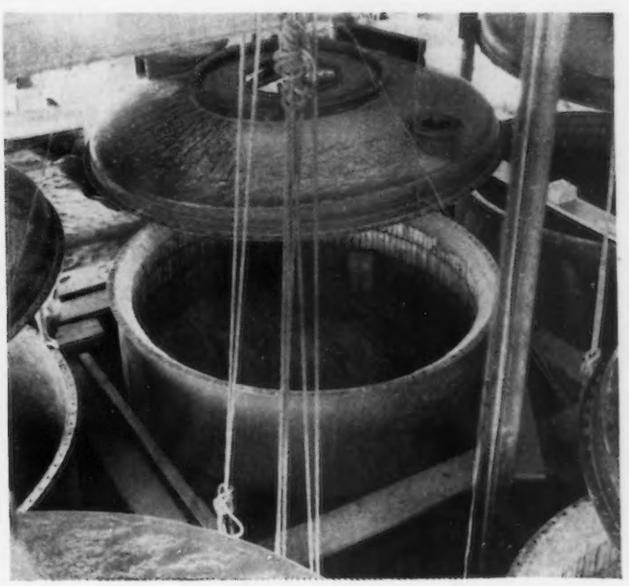
The small influence such tonnage would have on the national supply picture, even if it were all available for immediate shipment, is illustrated by the fact that one large steel company reports that its own outside purchases of scrap exceed 300,000 tons annually.





MANGANESE FROM NEVADA: Dr. R. R. Sayers, Bureau of Mines director, reports that the first unit of a group of pilot plants at Boulder City, Nev., has successfully produced concentrates with high manganese content from low-grade (18 per cent) ores in the Las Vegas, Nev., area. The U. S. now produces only 3 per cent of its needs for manganese. Russia has been one of the principal suppliers. These pilot plant photographs by the Bureau of Mines show (top left) a Skinner furnace and Baker cooler, (top right) a flotation unit, (left below) a Christensen spray chamber, and (right below) acid-proof leaching tanks. The Boulder City mill has a capacity of 40 tons each 24 hr.





Trade Notes . . .

Accounting departments of Ingalls Iron Works Co. and Ingalls Shipbuilding Corp. have been moved from principal offices of the companies at 720 Fourth Avenue, South, to 317 North Twentieth Street, Birmingham.

•

Superior Steel Corp. has opened a Southern California district office at 9730 Wilshire Blvd., Beverly Hills, Los Angeles, under the direction of Fred E. Leeming.

Park Chemical Co., Detroit, has appointed Ambrose McNamara, 215 Lansing Avenue, Utica, New York, as sales representative for heat treating products, grain cements, and polishing compounds, for New York State. H. W. Case of 52 Willow Street, Springfield, Mass., will represent this company for sales in the New England territory.

•

Latham Machine Co., Pittsburgh, has moved to a new building at 6635 Kelly Avenue, where more space and new equipment are expected to facilitate operations.

Sparkler Mfg. Co. has moved its factory and offices to larger quarters at Mundelein, Ill.

•

Harvey Furnace Co., 2935 St. Paul Street, Baltimore, has been organized to manufacture and sell stationary and tilting crucible, revolving non-crucible and iron pot furnaces, small cupolas and reverberatory furnaces for ferrous and non-ferrous melting, as well as heat treating furnaces.

MACHINE TOOLS

. . . SALES, INQUIRIES AND MARKET NEWS

$15,000,000 Worth of Tools Allocated to Russia

• • • **Acting upon recommendations** of Lend-Lease Administrator Edward R. Stettinius, Jr., the Priorities Division of the OPM has taken action designed to promote a steady flow of American-made machine tools to the Russian Government.

Special Allocation Order No. 1 has been served on approximately 35 machine tool manufacturers in this country, directing them to accept specified purchase orders placed by the Amtorg Trading Corp. on behalf of the Russian Government, provided that Amtorg meets regularly established prices and terms of sale. Manufacturers are further required to make deliveries on these orders on the dates specified.

It is estimated that purchases under this order will represent between $10,000,000 and $15,000,000 worth of tools. Some tools will start moving at once, with subsequent deliveries to be spread over the coming 12 months.

The importance of the order is indicated by a provision that no preference rating, urgency standing, or other order issued by the Priorities Division, is to interfere with delivery of the machine tools ear-marked for Russia, unless it shall so specify.

Machine tool production in the United States this year will amount to over $800,000,000 as compared with last year's $423,000,000.

Price Ceilings Being Studied

Cincinnati

• • • **Further inquiry** into the advisability of some price ceiling for new machine tools is to be indulged during the course of this week, at meetings between government officials and representatives of the machine tool industry. Factual data has already gone forward so that an actual trend in the situation is expected to develop from the current meetings. While OPA is conducting its price inquiry, OPM has been active in exploring new avenues for increased production. Manufacturers generally, continue to be cooperative in their efforts to expand production and all possible means are being indulged to accommodate the defense needs. At the same time, it is becoming daily apparent that the peak of new business has not yet been passed, and order books continue to bulge with new business.

Third Shift Still Light In Machine Tool Plants

• • • **Machine tool plants** continued to expand their second and third shifts between June and September, 1941, according to preliminary reports received by the Bureau of Labor Statistics from firms employing more than two-thirds of the workers in this industry. Wage earners in 79 reporting plants increased from 63,900 in June to 69,000 in September, a gain of approximately 8 per cent. The number of workers on second and third shifts increased by 12 and 22 per cent, respectively, during the three months' interval, though even in September only 24.9 per cent of the workers were on the second shift and 7.5 per cent were on the third.

While Sunday operations were still not extensive in September, a number of plants have increased their week-end operation since June. The number of workers at work on Sunday during June represented 5.7 per cent of the total in the 79 plants, and in September, 9.8 per cent. Aggregate man-hours worked during the surveyed week in September amounted to 3,650,000, an increase of 240,000 hours over the mid-week of June.

Overtime in September averaged 14 hours per week for 96 per cent of the workers, and showed little change since June.

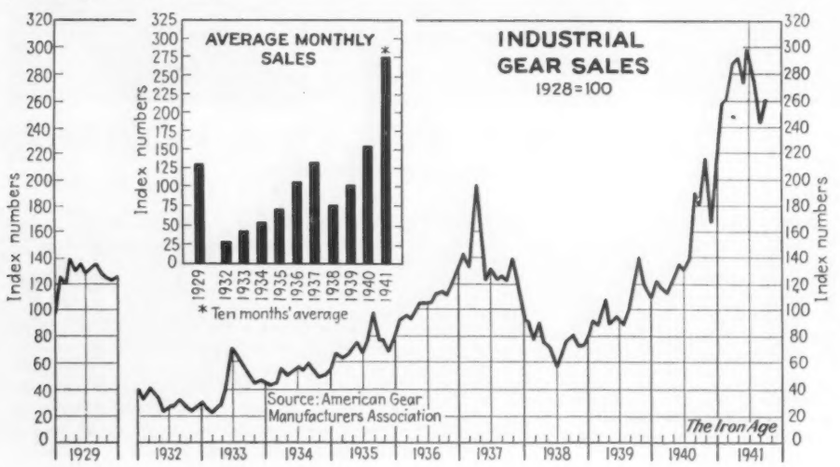
Strike Hits Navy Plant

Canton, Ohio

• • • **At the Naval** gun plant here Nov. 12 a one-day strike paralyzed production in order that strikers might get "certain things they had on their chests ironed out to their satisfaction."

October Gear Sales Gain 7.4 Per Cent

• • • Sales of industrial gears in October rose 7.4 per cent over the September volume, after declining three consecutive months, according to the gear sales index compiled by the American Gear Manufacturers' Association. The index for October, was reported at 261, as compared with 243 in September and 299 in June, the latter being the highest level ever recorded. In October, a year ago, the index stood at 216. The monthly average index for the current year through October is 275, as compared, or 86.7 per cent above the comparable period of 1940.



NON-FERROUS METALS

. . . MARKET ACTIVITIES AND PRICE TRENDS

Detailed Reports On Magnesium Ordered

• • • **Primary interests in** the non-ferrous markets this week focus on the OPM order of Nov. 14, for the detailed report of all stocks of magnesium and magnesium products not used for defense production by Nov. 30. The stocks reported will be sold to an approved producer or smelter to be turned over to defense manufacturers.

At the same time, the Priorities Division of OPM tightened control over the metal by putting it under a monthly allocation basis. Magnesium has been under control by priorities since March 24. The reason for the magnesium order is that stocks of the metal exist throughout the country in the form of scrap, finished and semi-finished products, powder and discarded products, which must be located for defense purposes.

Production, although increased, does not meet consumption. New plants now under construction, will get into production by mid-1942, and the present order was issued to relieve conditions until then.

Agents, bailees, and warehousemen are held responsible for reports on magnesium in their care. The order applies to all persons and any production in which magnesium is the principal ingredient.

RFC announced on Monday it had authorized a $12,000,000 loan to the Todd-California Shipbuilding Corp., Oakland, Cal., for the construction of three additional plants for the manufacture and fabrication of magnesium metals.

A special copper appeal form to assist manufacturers whose operations come under the special hardship clause of the copper conservation form, M-9-c, was announced by OPM. Priorities Field Offices are authorized to issue the form PD-167 or it may be obtained from Priorities Division, Washington, and appeals on this form must be mailed to the Director of Priorities, Washington.

Both stocks of copper on hand and production during October increased, reports of the Copper Institute indicate, while deliveries to Metals Reserve Co.'s account rose to a peak of 49,190 tons.

Facilities for the annual capacity of 17,000 tons of electrolytic slab zinc and 7200 tons of retort slab zinc at the East St. Louis, Ill., plant of the American Zinc Co. of Illinois, will be provided under a $4,000,000 DPC lease agreement announced on Monday.

The Council of Tin Producers Association, in London, submitted a proposal to the Colonial Secretary seeking withdrawal of the Malayan export duty on tin ore. It is believed here that the proposal is an effort to have tin ore and concentrate surpluses in the Malayan Straits move to United States for smeltering. The heavy export duty was levied primarily to keep tin smelting within the Empire.

Tin shipments from the British Isles may begin by the end of December.

Non-Ferrous Prices

(Cents per lb. for early delivery)

Copper, Electrolytic[1]	12.00
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis[2]	8.25
Lead, St. Louis[3]	5.70

[1] Mine producers' quotations only, delivered Conn. Valley. Deduct ¼c. for approximate New York delivery price. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 15c.-17c. a lb.; No. 12 remelt No. 2, standard, 16c. a lb. NICKEL electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICKSILVER, $195 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 13.25c. a lb.



SCRAP

. . . MARKET ACTIVITIES AND PRICE TRENDS

Carloads Rerouted; Coast Step Taken

• • • **OPM tightened** its control over scrap shipments in new areas last week with diversions from one plant to another following appeals from hard-pressed steel mill operators. There were several instances similar to the shifting to Sharon Steel Corp. of scrap destined for Bethlehem Steel Co. A step was taken toward stricter administration on the West Coast when two officials were despatched to study conditions there. Ultimately slight readjustments of Pacific Coast prices may be made.

Meanwhile, iron and steel scrap interests over the nation were either engaged in filling out the new monthly scrap report forms, or were awaiting receipt of their blank copies early this week.

The new scrap reporting forms are shown on pages 99-C and 99-D of this issue. Copies of these forms may be obtained at cost from THE IRON AGE, Reader Service Department, 100 East 42 Street, New York.

In connection with expansion recommended for Inland Steel Co., Chairman E. L. Ryerson warned that "the company's reserves of steel scrap are being diminished steadily, and this may result in curtailment of operations unless the supply increases."

Tonnage handled by some dealers and yards showed a drop in October compared with the same month a year ago. At New York, a 35 per cent decline was reported by some dealers, part of it caused by direct dealing by mills.

Unable to Boost Wages, New York Yards Assert

• • • **Hearings concluded** at New York last Saturday before a formal arbitration board on whether wage increases shall be granted members of an A. F. of L. union by 80 scrap yards. Benjamin Schwartz, vice president of Schiavone-Bonomo Corp., who acted as counsel for the employers, brought out testimony which showed that scrap yard operators would be unable to absorb wage increases because of frozen prices; that business volume has fallen for the yards involved because of direct dealing on the part of mills; and that yards are reducing their employee rolls.

The union, which has a closed shop agreement, demands $1 per hour for yard men against the contract provision of 57½ cents; $1.25 per hour for chauffeurs and burners against 77½ cents; $1.25 per hour for shearmen against 57½ cents.

About 600 employees are involved. The board's decision is not expected immediately.

Enforcement Officials Arrive on West Coast

• • • **Two OPA officials** representing the price division arrived in San Francisco this week to begin preliminary work in connection with the administration and enforcement of iron and steel scrap price schedules on the Pacific Coast. They are William S. Whitehead and Harold Swope of the legal division's enforcement section.

Headquarters will be established in the Newhall Bldg., San Francisco. According to Leon Henderson, OPA administrator, it is felt administration and enforcement can be handled more effectively through the new setup than through the long distance han-

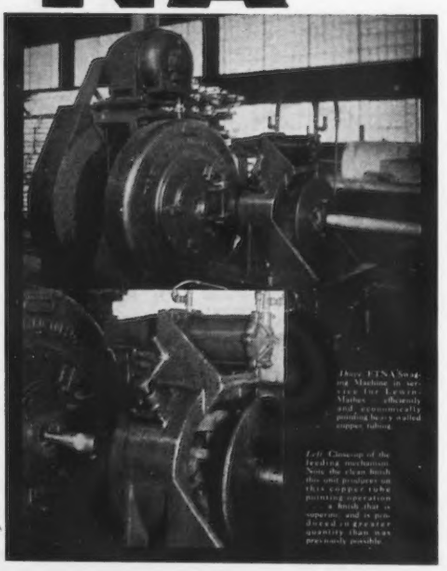
LEWIN-MATHES *Got the right answer at*

ETNA

They had a job of pointing heavy-walled copper tubing, and wanted to speed up the operation. Just how to do it didn't appear on the horizon, and so Lewin-Mathes did the safe and logical thing—they put their swaging job up to Etna.

The answer to that problem is illustrated on this page. It's a modern Etna Swaging Machine that points *more* copper tubes per hour in less time at less cost. If you have a problem involving tapering or reducing tubing and solid rounds—ask Etna about it.

Etna has the swaging machines from ⅜" to 4" and the experience to help you get the most out of this type of machine.



IF IT'S A QUESTION OF TAPERING, SIZING OR REDUCING OF ROUND SOLIDS OR TUBING... "Ask ETNA About Swaging"

ETNA MACHINE COMPANY
TOLEDO OHIO

dling which prevailed previously. He added that "test checks have disclosed numerous cases of evasion of the price schedule."

•

PITTSBURGH—The necessity for more allocations is appearing each day. It is believed the steel industry will do well this year if total output reaches 82,000,000 tons instead of 84,000,000 predicted earlier.

•

DETROIT—Quantities on the docks waiting shipment are not large. Unless allocations and some changes in price schedules arise to alter the picture, the scrap usually shipped by water probably will remain here during the winter and will help alleviate the local situation. The trade looks for less scrap production for the remainder of the year and during the winter months when auto output will be further reduced.

•

ST. LOUIS—A district mill working on defense orders, for whose benefit OPM sent a wire last week appealing for supplies, received sufficient tonnage to maintain operations for the next two weeks.

•

CLEVELAND—OPM's allocations of tonnages have helped at several consuming points in Ohio. Such allocations continue to be made on behalf of Republic Steel and Sharon Steel. One observer holds that perhaps if some coordination existed between OPM and OPA, a better flow of scrap might result.

•

NEW YORK—The abandoned New York, Westchester & Boston Railroad was sold by Federal Court for $550,000 to a syndicate which includes Allied Meta's & Minerals Corp. of New York, Michael-Flynn, Inc., Citron-Byer Co. and other concerns and individuals. The property includes 5500 tons of relaying rails.

Canada Licenses All Scrap Dealers

Ottawa

• • • F. B. Kilbourn, Canadian steel controller, has ordered a $100 license fee for all scrap dealers, with the object of more effective control and distribution of scrap iron and steel in Canada. The order is retroactive and applies to persons already licensed.

BIRMINGHAM—The scrap flow remains far below demand and stock piles continue to dwindle.

•

TORONTO—The scrap situation is reaching alarming proportions. Mills are calling for material at a rate more than double that of peace time years and as a result all surplus holdings have been wiped out. Imports from the United States are reduced. The cast scrap supply is far short of demand.

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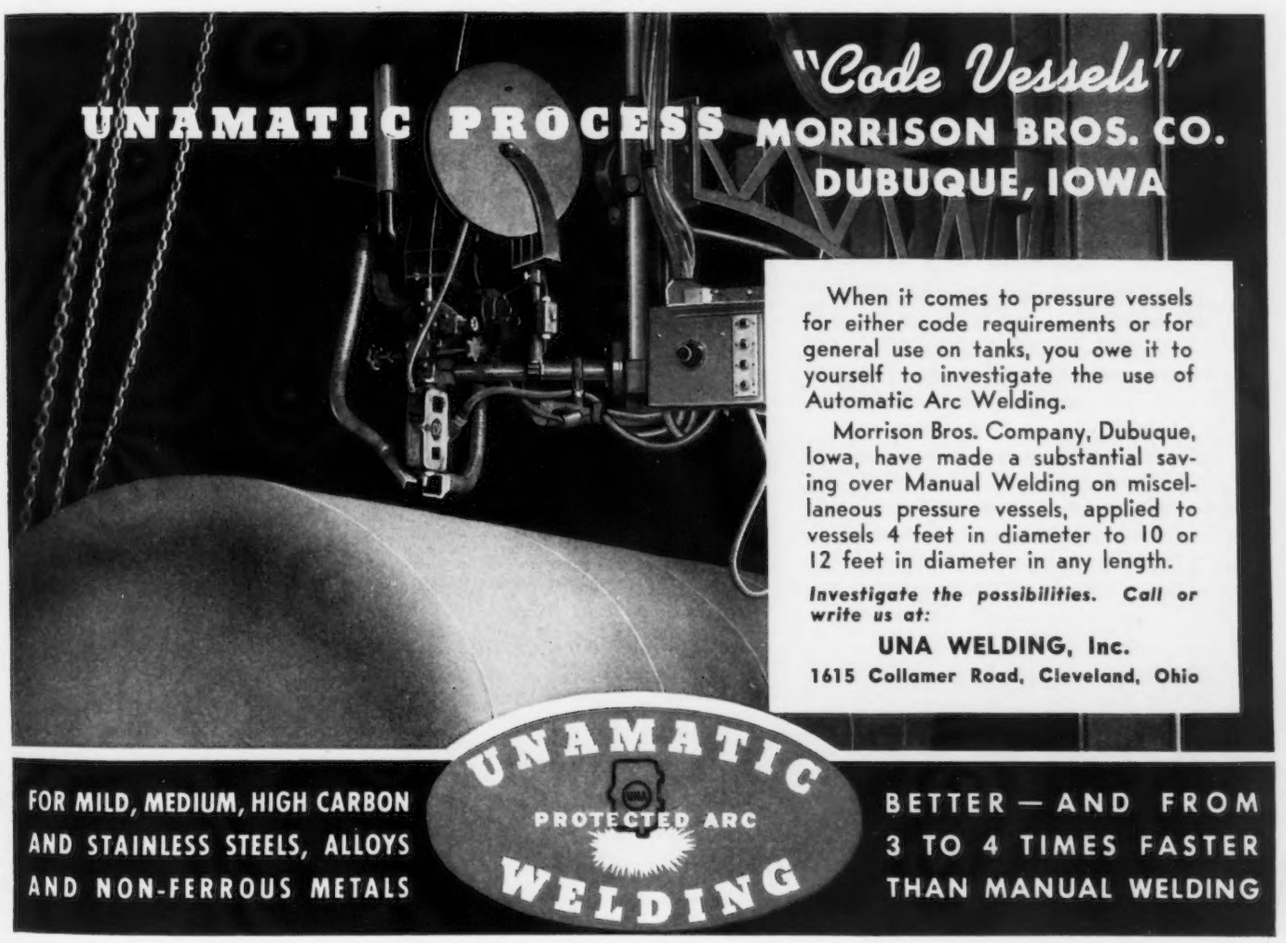
CINCINNATI—Foundrymen continue to ask Washington for relief on foundry grades, and so far the situation has been unchanged except for reduction of melt in a few isolated instances.

•

BUFFALO—A consignment of several hundred tons of scrap, ready for shipment from Jamestown to Bethlehem's Lackawanna plant, has been allocated by OPM to Sharon Steel at Lowellville, Ohio.

•

BOSTON—Foundries are waiting for the new report forms. Barge shipments from Providence, R. I., to eastern Pennsylvania continue. The Washburn Wire Co., Phillipsdale, R. I., is in the market for No. 1 steel at $14.06 a ton and for No. 2 steel at $13.06.



Iron and Steel Scrap (other than railroad scrap)

(Maximum basing point prices as revised by OPA to Sept. 26, 1941, from which shipping point prices and consumers' delivered prices are to be computed, per gross ton)

Basing Points → / ↓ GRADES	Pittsburgh	Johnstown, Weirton, Steubenville, Youngstown, Warren, Sharon, Canton	Chicago	Kokomo	Bethlehem	Claymont, Coatesville, Phoenixville, Harrisburg	Sparrows Point	Buffalo	Cleveland	Toledo	Cincinnati* Portsmouth, Middletown, Ashland	St. Louis	Detroit	Duluth, Minneapolis**	Birmingham	Chattanooga	Radford, Va	Worcester, Bridgeport, Phillipsdale, R. I.	Los Angeles, San Francisco, Seattle, Portland	Minnequa, Colo.
No. 1 heavy melting	$20.00	$20.00	$18.75	$18.25	$18.25	$18.75	$18.75	$19.25	$19.50	.....	$19.50	$17.50	$17.85	$18.00	$17.00	.....	.....	.....	$14.50	$16.50
No. 1 hyd. comp. black sheet	20.00	20.00	18.75	18.25	18.25	18.75	18.75	19.25	19.50	.....	19.50	17.50	17.85	18.00	17.00	.....	.....	.....	14.50	16.50
No. 2 heavy melting	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	.....	(See	13.50	15.50
Dealers' No. 1 bundles	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	16.50	16.85	17.00	16.00	.....	.....	foot-	13.50	15.50
Dealers' No. 2 bundles	18.00	18.00	16.75	16.25	16.25	16.75	16.75	17.25	17.50	.....	17.50	15.50	15.85	16.00	15.00	.....	.....	notes)	12.50	14.50
Mixed borings and turnings	15.25	15.25	14.00	14.25	13.50	14.00	14.00	14.50	14.75	13.10	14.75	12.75	13.10	.....	12.25	.....	.....	.....	9.75	11.75
Machine shop turnings	15.50	15.50	14.25	14.50	13.75	14.25	14.25	14.75	15.00	13.35	15.00	13.00	13.35	15.50	15.00	Alloy, ...	W.Va., 17.60	.....	10.00	12.00
Shoveling turnings	16.50	16.50	15.25	15.50	14.75	15.25	15.25	15.75	16.00	14.35	16.00	14.00	14.35	16.50	.....	.....	.....	.....	11.00	13.00
No. 1 busheling	19.50	19.50	18.25	17.75	17.75	18.25	18.25	18.75	19.00	.....	19.00	17.00	17.35	17.50	16.00	.....	.....	.....	14.00	16.00
No. 2 busheling	15.50	15.50	14.25	13.75	13.75	14.25	14.25	14.75	15.00	.....	15.00	13.00	13.35	13.50	12.50	.....	.....	.....	10.00	12.00
Cast iron borings	15.75	15.75	14.50	14.00	14.00	14.50	14.50	15.00	15.25	13.60	[6]15.25	13.25	13.60	13.75	12.75	.....	.....	.....	10.25	12.25
Uncut structural, plate scrap	19.00	19.00	17.75	17.25	17.25	17.75	17.75	18.25	18.50	.....	18.50	18.50	16.85	17.00	16.00	.....	.....	.....	13.50	15.50
No. 1 cupola	21.00	21.00	20.00	20.00	22.50	23.00	22.00	20.00	22.00	.....	21.00	20.00	20.35	*19.00	20.00	20.50	21.00	22.00	18.00	.....
Heavy breakable cast	19.50	19.50	18.50	18.50	21.00	21.50	21.00	18.50	20.50	.....	19.50	18.50	18.85	*17.50	18.50	.....	.....	20.50	17.00	.....
Stove plate	19.00	[5]19.00	17.00	16.00	18.00	18.50	18.00	19.00	18.00	15.60	17.50	17.00	14.10	*16.00	17.00	17.50	18.00	17.50	14.00	.....
Low phos. billet, bloom crops	25.00	25.00	23.75	23.75	23.25	23.75	23.75	24.25	24.50	.....	23.50	22.50	22.85	23.00	22.00	.....	.....	.....	19.50	.....
Low phos. bar crops, smaller	23.00	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	.....	.....	19.50	.....
Low phos. pu'ch'gs, plate scrap[1]	24.75	23.00	21.75	21.75	21.25	21.75	21.75	22.25	22.50	.....	21.50	20.50	20.85	21.00	20.00	.....	.....	.....	17.50	.....
Machinery cast, cupola size[2]	22.00	22.00	21.00	21.00	23.50	24.00	23.50	21.00	23.00	.....	22.00	21.00	21.35	*20.00	21.00	21.50	22.00	23.00	19.00	.....
No. 1 mach. cast, drop-broken, 150 lb. and under	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50	23.50	19.50	.....
Clean auto cast	22.50	22.50	21.50	21.50	24.00	24.50	24.00	21.50	23.50	.....	22.50	21.50	21.85	20.50	21.50	22.00	22.50	23.50	19.50	.....
Punchings and plate scrap[3]	23.75	22.00	20.75	20.75	20.25	20.75	20.75	21.25	21.50	.....	20.50	19.50	19.85	20.00	19.00	.....	.....	.....	16.50	.....
Punchings and plate scrap[4]	22.75	21.00	19.75	19.75	19.25	19.75	19.75	20.25	20.50	.....	19.50	18.50	18.85	19.00	18.00	.....	.....	.....	15.50	.....
Heavy axle, forge turnings	21.25	19.50	18.25	18.25	17.75	18.25	18.25	18.75	19.00	.....	18.00	17.00	17.35	17.50	16.50	.....	.....	.....	14.00	.....
Medium h'vy el f'ce turnings	19.75	18.00	16.75	16.75	16.25	16.75	16.75	17.25	17.50	.....	16.50	15.50	15.85	16.00	15.00	.....	.....	.....	12.50	.....

[1] This grade is ⅝-in. and heavier, cut 12 in. and under. [2] May include clean agricultural cast. [3] Under ⅝ to ¼-in., cut 12 in. and under. [4] Under ¼-in. to No. 12 gage, cut 12 in. and under. [5] Youngstown, Warren, Sharon and Canton are not basing points on this grade. [6] Middletown and Cincinnati price for this grade is $15. * Includes Newport, Ky. Shipping point price within Cincinnati basing point may be 80c. a ton below basing point price listed above for all grades except the six cast grades. ** Minneapolis and St. Paul are basing points on following grades only: No. 1 cupola, heavy breakable cast, stove plate, machinery cast cupola size, No. 1 machinery cast drop broken, clean auto cast.

Railroad Scrap *(Per gross ton, delivered consumers' plants located on line of railroad originating scrap)*

Basing Points → / ↓ GRADES	Pittsburgh, Sharon, Pa., Wheeling, Steubenville, Youngstown, Canton	Chicago	Kokomo	Philadelphia	Wilmington	Sparrows Point	Cleveland	Buffalo	Portsmouth, Middletown, Ashland	St. Louis	Kansas City	Cincinnati	Detroit	Duluth	Birmingham	Los Angeles, San Francisco, Seattle
No. 1 heavy melting	$21.00	$19.75	$19.25	$19.75	$19.75	$19.75	$20.50	$20.25	$20.50	$18.50	$17.00	$20.50	$18.85	$19.00	$18.00	$15.50
Scrap rails	22.00	20.75	20.25	20.75	20.75	20.75	21.50	21.25	21.50	19.50	18.00	21.50	19.85	20.00	19.00	16.50
Rerolling rails	23.50	22.25	21.75	22.25	22.25	22.25	23.00	22.75	23.00	21.00	19.50	23.00	21.35	21.50	20.50	18.00
Scrap rails 3 ft. and under	24.00	22.75	22.25	22.75	22.75	22.75	23.50	23.25	23.50	21.50	20.00	23.50	21.85	22.00	21.00	18.50
Scrap rails 2 ft. and under	24.25	23.00	22.50	23.00	23.00	23.00	23.75	23.50	23.75	21.75	20.25	27.75	22.10	22.25	21.25	18.75
Scrap rails 18 in. and under	24.50	23.25	22.75	23.25	23.25	23.25	24.00	23.75	24.00	22.00	20.50	24.00	22.35	22.50	21.50	19.00

Railroads not operating in a basing point may sell rerolling rails f.o.b. their lines at average price of their sales from Sept. 1, 1940, to Jan. 31, 1941. Rerolling mills may absorb all transportation charges necessary to obtain such rails. Maximum prices for scrap rails and rerolling rails from mines, logging camps and similar sources need not be sold for less than $13.50 a gross ton for scrap rails and $15 for rerolling material at shipping point.

Where the railroad originator of the scrap operates in two or more of the basing points named, the highest of the maximum prices established for such basing points shall be the maximum price of the scrap delivered to a consumer's plant at any point on the railroad's line, except that switching charges of 84c. per gross ton shall be subtracted from the maximum prices of scrap originating from railroads operating in Chicago and sold for consumption outside Chicago.

Explanatory Notes

(A basing point includes its switching district)

MAXIMUM PRICE at which any grade of scrap may be delivered to consumer's plant, wherever located, is the shipping point price, plus actual transportation from the shipping point to consumer. Where shipment is by water, actual handling charges at the dock of not more than 75c. a gross ton may be included as part of transportation charges. In no case may this maximum price exceed by more than $1 prices (for material other than railroad scrap) for the basing point nearest the consumer.

COMPUTING SHIPPING POINT PRICE: A shipping point is the point from which the scrap is to be shipped to a consumer. A shipping point price is computed as follows: (a) For Shipping Points located within a basing point.—The price established for the basing point in which the shipping point is located, is determined. Then deduct from this the actual costs involved in transporting scrap from the shipping point to the consumer's plant within the basing point which is nearest, in terms of transportation costs, to the shipping point; (b) For shipping points located outside a basing point.—The price established for the nearest basing point, in terms of transportation charges, to the shipping point is determined. Deduct from this the lowest established charge for transporting scrap from the shipping point to such basing point. *Exceptions:* (1) The shipping point price at any shipping point in New England, of those grades of scrap for which no prices are listed above shall be the Johnstown basing point price, minus the all-rail transportation costs from the New England shipping point to Johnstown; (2) Shipping point prices for New York City, Brooklyn, New York, and New Jersey shall be computed from the Bethtlehem, Pa., basing point.

GULF PORT PRICES: Scrap shipped from Tampa, Pensacola, Gulfport, Mobile, New Orleans, Lake Charles, Port Arthur, Beaumont, Galveston, Texas City, Houston and Corpus Christi, has a maximum shipping point price not exceeding $14 a gross ton, f.o.b. cars, for No. 1 heavy melting steel. For other grades, the differentials established for Birmingham apply.

REMOTE SCRAP: Defined as all grades of scrap listed in table above (exclusive of railroad scrap) located in Florida, Montana, Idaho, Wyoming, Nevada, Arizona, New Mexico, Texas and Oklahoma. Maximum shipping point price of remote scrap is $12 a gross ton, for No. 2 heavy melting steel, with differentials for other grades the same as differentials established in table above for St. Louis. The maximum delivered price of remote scrap is the shipping point price, plus actual transportation charges, except that when necessary to absorb transportation charges, the maximum delivered price may be exceeded by a maximum of $4 a ton. Thus the maximum delivered price for remote scrap may exceed the price for the nearest basing point by $5. In the event that an allowance in excess of $5 a ton is necessary to acquire a tonnage of remote scrap, a consumer may apply to OPA for permission to exceed the $5 allowance. Purchases under these remote scrap provisions must be for not less than one car a month and must be reported in detail. Provisions of this remote scrap section expire Dec. 31, 1941.

BROKER COMMISSIONS: A commission of up to 50c. a ton above the maximum prices is allowed to brokers.

*OPA maximum for sale by dealer. **Nominal.

UNPREPARED SCRAP: Regardless of source, maximum price of unprepared scrap is $2.50 less than maximum for corresponding grade of prepared scrap.

BILLET AND BLOOM CROPS: Where such material originates in the Pittsburgh basing point, it may be sold delivered to a consumer within or without the Pittsburgh point at the price given in Schedule 'A, plus not more than $2.50 in transportation charges. Lowest established transportation charges will govern.

Non-Ferrous Scrap

(Dealers buying prices, cents per lb.)

	New York	Philadelphia	Pittsburgh	Cleveland	Detroit	Chicago
No. 1 hvy. copper	*10.00	*10.00	*10.00	*10.00	*10.00	*10.00
Light copper	* 8.00	* 8.00	* 8.00	* 8.00	* 8.00	* 8.00
Hvy. yel. brass	6.25-6.50	**6.25	7.50-8.00	5.75 6.25	7.00-7.25	7.50
Light brass	5.25-5.50	**5.50	7.00-7.25	6.00-6.50	6.50-6.75	7.00-7.25
No. 1 Comp. turn.	8.75-9.00	**7.75	**9.00-9.25	8.50-9.00	9.00-9.25	9.00-9.25
New brass clips	8.00-8.25	8.50-9.00	7.75-8.00	8.00-8.50	7.50-8.00	7.75-8.25
Soft lead	5.25-5.50	5.00-5.25	4.75-5.00	4.75-5.00	5.00-5.25	4.75-5.00
Old zinc	4.00-4.25	4.25	4.25-4.50	4.00-4.50	4.25-4.50	4.50-5.00
Cast, forged alum.	*11.00	*11.00	*11.00	*11.00	*11.00	*11.00
Old sheet alum.	*11.00	*11.00	*11.00	*11.00	*11.00	*11.00
Solder joints	8.75-9.00	9.00	7.50-8.00	6.50-6.75	5.50-6.00	7.50-8.00
No. 1 pewter	35.00-36.00	35.00-36.00	31.00-32.00	32.50-34.00	37.50-38.50	32.80-34.00

* OPA maximum for sale by dealer. ** Nominal.

. . . Comparison of Prices

(Advances Over Past Week in **Heavy Type**; Declines in ***Italics***)

(Prices Are F.O.B. Major Basing Points)

	Nov. 18, 1941	Nov. 11, 1941	Oct. 21, 1941	Nov. 19, 1940
Flat Rolled Steel:				
(Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate:				
(Dollars Per Base Box)				
Tin plate	$5.00	$5.00	$5.00	$5.00
Manufacturing ternes	4.30	4.30	4.30	4.30
Bars and Shapes:				
(Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wire and Wire Products:				
(Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails:				
(Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel:				
(Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
‡Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp:				
(Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

	Nov. 18, 1941	Nov. 11, 1941	Oct. 21, 1941	Nov. 19, 1940
Pig Iron:				
(Per Gross Ton)				
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.84	$24.84
No. 2, Valley furnace	24.00	24.00	24.00	23.00
No. 2, Southern Cin'ti	24.06	24.06	24.06	23.06
No. 2, Birmingham	20.38	20.38	20.38	19.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	23.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	24.34
Basic, Valley furnace	23.50	23.50	23.50	22.50
Malleable, Chicago†	24.00	24.00	24.00	23.00
Malleable, Valley	24.00	24.00	24.00	23.00
L. S. charcoal, Chicago	31.34	31.34	31.34	30.34
Ferromanganese‡	120.00	120.00	120.00	120.00
Scrap:				
(Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$21.75
Heavy melt'g steel, Phila.	18.75	18.75	18.75	20.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	20.25
No. 1 hy. com. sheets, Det.	17.85	17.85	17.85	20.25
Low phos. plate, Youngs'n	23.00	23.00	23.00	24.00
No. 1 cast, Pittsburgh	22.00	22.00	22.00	22.25
No. 1 cast, Philadelphia	24.00	24.00	24.00	22.75
No. 1 cast, Ch'go*	21.00	21.00	21.00	18.00
Coke, Connellsville:				
(Per Net Ton at Oven)				
Furnace coke, prompt	$6.125	$6.125	$6.125	$5.25
Foundry coke, prompt	6.875	6.875	6.875	5.75
Non-Ferrous Metals:				
(Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	50.375
Zinc, East St. Louis	8.25	8.25	8.25	7.25
Lead, St. Louis	5.70	5.70	5.70	5.65
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.

*Changed to gross ton basis, April 3, 1941.

*Mine producers only.

The various basing points for finished and semi-finished steel are listed in detailed price tables, pages 136-152.

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

. . . Composite Prices

	FINISHED STEEL	PIG IRON	SCRAP STEEL
Nov. 18, 1941	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.30467c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.30467c. a Lb.	$22.61 a Gross Ton	$20.92 a Gross Ton

	FINISHED STEEL High	FINISHED STEEL Low	PIG IRON High	PIG IRON Low	SCRAP STEEL High	SCRAP STEEL Low
1941	2.30467c.,	2.30467c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 10
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99629c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

A weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip. These products represent 78 per cent of the United States output. This revised index recapitulated to 1929 in the Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Prices of Finished Iron and Steel...

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes[2]	3.80¢		3.80¢									4.55¢			
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
TIN PLATE															
Standard cokes, base box	$5.00	$5.00	$5.00						$5.10						$5.32
BLACK PLATE															
29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (10)			3.37¢
TERNES M'FG.															
Special coated, base box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢	2.39¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢	2.25¢		2.47¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					3.01¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢		(Bethlehem, Massillon, Canton = 2.70¢					2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
PLATES								(Coatesville and Claymont = 2.10¢)							
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.25¢(11)		2.45¢	2.65¢	2.25¢	2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.95¢	4.15¢		3.70¢	3.37¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.92¢
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.92¢
Spring	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.80¢			3.52¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢
IRON BARS															
Common		2.25¢			(Terre Haute, Ind. = 2.15¢)										
Wrought single refined	4.40¢														
Wrought double refined	5.40¢														

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Straight lengths as quoted by distributers. [8] Also shafting. For quantities of 20,000 to 39,999 lb. [9] Carload lot to manufacturing trade. [10] Boxed. [11] Ship plates only.

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2 higher; f.o.b. Duluth, billets only, $2 higher.

Per Gross Ton

Rerolling $34.00
Forging quality 40.00

Shell Steel

Basic open hearth shell steel, f.o.b. Pittsburgh and Chicago.

Per Gross Ton

3 in. to 12 in..... $52.00
12 in. to 18 in..... 54.00
18 in. and over..... 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open hearth or bessemer..... $34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved, universal and sheared 1.90c.

Wire Rods

(No. 5 to 9/32 in.)	*Per Lb.*
Pittsburgh, Chicago, Cleveland.	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

Alloy Steel Blooms, Billets and Slabs

Per Gross Ton

Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem $54.00

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed	67c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices are delivered quotations per gross ton computed on the basis of the official maxima.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorous	Charcoal
Boston	$25.50	$25.00	$26.50	$26.00	.....	.....
Brooklyn	27.50	.....	.....	28.00	.....	.....
Jersey City	26.53	26.03	27.53	27.03	.....	.....
Philadelphia	25.84	25.34	26.84	26.34	.....	.....
Bethlehem, Pa.	**$25.00**	**$24.50**	**$26.00**	**$25.50**	.....	.....
Everett, Mass.	**25.00**	**24.50**	**26.00**	**25.50**	.....	.....
Swedeland, Pa.	**25.00**	**24.50**	**26.00**	**25.50**	.....	.....
Steelton, Pa.	.....	**24.50**	.....	.....	**$29.50**	.....
Birdsboro, Pa.	**25.00**	**24.50**	**26.00**	**25.50**	**29.50**	.....
Sparrows Point, Md.	**25.00**	**24.50**	.....	.....	.....	.....
Erie, Pa.	**24.00**	**23.50**	**25.00**	**24.50**	.....	.....
Neville Island, Pa.	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Sharpsville, Pa.*	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Buffalo	**24.00**	**23.00**	**25.00**	**24.50**	**29.50**	.....
Cincinnati	24.44	24.61	.....	25.11	.....	.....
Canton, Ohio	25.39	24.89	25.89	25.39	.....	.....
Mansfield, Ohio	25.94	25.44	26.44	25.94	.....	.....
St. Louis	24.50	24.02	.....	.....	.....	.....
Chicago	**24.00**	**23.50**	**24.50**	**24.00**	.....	....$31.34
Granite City, Ill.	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Cleveland	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Hamilton, Ohio	**24.00**	**23.50**	.....	**24.00**	.....	.....
Toledo	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Youngstown*	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Detroit	**24.00**	**23.50**	**24.50**	**24.00**	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	**$28.00**
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	**33.00**
St. Paul	26.63	.....	27.13	26.63	.....	.....
Duluth	**24.50**	.....	**25.00**	**24.50**	.....	.....
Birmingham	**20.38**	**19.00**	**25.00**	.....	.....	.....
Los Angeles	27.50	.....	.....	.....	.....	.....
San Francisco	27.50	.....	.....	.....	.....	.....
Seattle	27.50	.....	.....	.....	.....	.....
Provo, Utah	**22.00**	.....	.....	.....	.....	.....
Montreal	27.50	27.50	.....	28.00	.....	.....
Toronto	25.50	25.50	.....	26.00	.....	.....

GRAY FORGE IRON

Valley or Pittsburgh furnace..... **$23.50**

***Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.**

Switching Charges: Basing point prices are subject to an additional charge for delivery within the switching limits of the respective districts.

Silicon Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of basic grade (1.75 per cent to 2.25 per cent).

Phosphorous Differential: Basing point prices are subject to a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over.

†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

Manganese Differentials: Basing point prices are subject to an additional charge not to exceed 50c. a ton for each 0.50 per cent manganese content in excess of 1.00 per cent.

WAREHOUSE PRICES

	Pittsburgh	Chicago	Cleveland	Philadelphia	New York	Detroit	Buffalo	Boston	Birmingham	St. Louis	St. Paul	Milwaukee	Los Angeles
Sheets, hot rolled	$3.35	$3.25	$3.35	$3.75	$3.58	$3.43	$3.25	$3.71	$3.45	$3.39	$3.30	$3.38	$5.10
Sheets, cold rolled	....	4.10	4.05	4.05	4.60	4.30	4.30	3.68	....	4.24	4.35	4.23	7.30
Sheets, galvanized	4.65	4.85	4.75	5.00	5.00	4.84	4.75	5.11	4.75	4.99	4.75	4.98	6.30
Strip, hot rolled	3.60	3.60	3.50	3.95	3.96	3.68	3.82	4.06	3.70	3.74	3.65	3.73	....
Strip, cold rolled	3.20	3.50	3.20	3.31	3.51	3.40	3.52	3.46	....	3.61	3.83	3.54	....
Plates	3.40	3.55	3.40	3.75	3.76	3.60	3.62	3.85	3.55	3.69	3.80	3.68	4.95
Structural shapes	3.40	3.55	3.58	3.75	3.75	3.65	3.40	3.85	3.55	3.69	3.80	3.68	4.95
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.64	3.75	3.63	**4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300	7.45	7.35	7.55	7.31	7.60	7.67	7.35	7.50	....	7.72	7.45	7.58	10.35
Bars, ht. rld. SAE 3100	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	....	6.02	6.00	5.88	9.35
Bars, cd. drn. SAE 2300	8.40	8.40	8.40	8.56	8.84	8.70	8.40	8.63	....	8.77	8.84	8.63	11.35
Bars, cd. drn. SAE 3100	6.75	6.75	7.75	7.16	7.19	7.05	6.75	7.23	....	7.12	7.44	6.98	10.35

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb., galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions; Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb., cold rolled strips, 0.0971 in. thick; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., cold rolled strip 0.095 in. and lighter; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb., New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 24 ga.—1 to 1499 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, $3.43. **Over 4 in. wide and over 1 in. thick, $4.95.

CORROSION AND HEAT-RESISTING STEELS

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F. Billets	15.73c.	16.15c.	19.13c.	23.38c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	25.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
*Motor	4.95c.
*Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 75c. per 100 lb.

*In some instances motor grade is referred to as dynamo grade and dynamo grade is referred to as dynamo special.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, per Package of 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00
25-lb. coating I.C.	8.00	16.00
30-lb. coating I.C.	8.63	17.25
40-lb. coating I.C.	9.75	19.50

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and Carriage Bolts:

6½ in., shorter and smaller	65½
6 x ⅝ in., and shorter	63½
6 in. by ¾ to 1 in. and shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:

(hexagon or square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose 71 and 10

Stove bolts in packages, with nuts attached 71

Stove bolts in bulk.....80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York lots of 200 lb. or over.

Large Rivets

(½ in. and larger)

Base per 100 lb.

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $3.75

Small Rivets

(7/16 in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .....65 and 5

Cap and Set Screws

Per Cent Off List

Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	68
Milled studs	40
Flat head cap screws, listed sizes	30
Filister head cap, listed sizes	46

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

WIRE PRODUCTS

(To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg

Standard wire nails.....$2.55

Coated nails 2.55

Cut nails, carloads..... 3.85

Base per 100 Lb.

Annealed fence wire.....$3.05

Base Column

Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes Minimum Wall

(Net base prices per 100 ft., f.o.b. Pittsburgh, in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld, Hot Rolled
	$	$	$
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)

Base Price = $200 Per Net Ton

Steel (Butt Weld)

	Black	Galv.
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½

Wrought Iron (Butt Weld)

½ in.	24	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18

Steel (Lap Weld)

2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½

Wrought Iron (Lap Weld)

2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17

Steel (Butt, extra strong, plain ends)

	Black	Galv.
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57

Wrought Iron (Same as Above)

½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½

Steel (Lap, extra strong, plain ends)

2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56

Wrought Iron (Same as above)

2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld 8 in. and smaller.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago.

FUEL OIL

No. 3, f.o.b. Bayonne, N. J.	5.20c.
No. 6, f.o.b. Bayonne, N. J.	3.21c.
No. 6 Bur. Stds., del'd Chicago	4.50c.
No. 3 distillate del'd Cleveland	6.50c.
No. 4 indus., del'd Cleveland	6.00c.
No. 6 indus., del'd Cleveland	5.00c.

WITH HELL LET LOOSE ABOVE

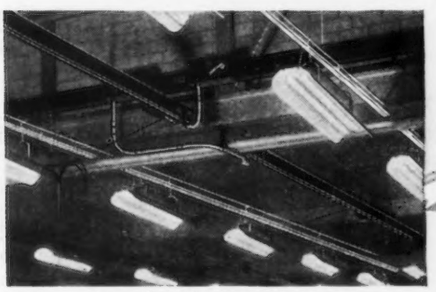
Our Warplane Plants are Beating Schedules with the Help of BullDog "Plug-in" Light and Power

DAY BY DAY new aircraft plants — and tank plants, gun plants, engine plants, shell plants — are going up from coast to coast. And from Hell Gate to the Golden Gate more and more of these new defense plants are being equipped with BullDog "plug-in" flexible electrical distribution systems.

BullDog's three "plug-in" Bus Duct Systems are ideally suited to save time for industry — to avoid wiring delays or delays in planning new buildings. For BullDog Systems permit a "plug-in" for light or power at any point, as easily as plugging in the breakfast toaster.

For Large or Small Plants

Designed for mass production problems, by mass production experts, BullDog Bus Duct Systems meet the demands of the largest and smallest plants for *ready* light and power *anywhere*. The three systems — BullDog BUStribution DUCT, for *Power;* Universal Trol-E-Duct, for *Light,* and Industrial Trol-E-Duct, for *Production Lines or Assembly Benches* — are used singly or in combination.



Section of a modern defense plant showing 2 runs of 125 amp. BullDog BUStribution DUCT branching off a main run of 500 amp. capacity. The fluorescent lights are both fed and supported by BullDog Universal Trol-E-Duct.

BullDog Bus Duct Systems are built in standardized, interchangeable sections; are quick and easy to install or to move from one position or one plant to another, and are completely salvable and reusable.

To learn how you can have ready light and power *wherever and whenever needed,* write for complete information on BullDog "plug-in" Bus Duct Systems. Better yet, ask to have one of our engineering representatives talk to you about equipping the new plant you are planning, or modernizing your present light and power distribution system.

BULLDOG
ELECTRIC PRODUCTS CO.
DETROIT, MICHIGAN
BullDog Electric Products of Canada, Ltd., Toronto, Ontario

ORIGINATORS OF FLEXIBLE ELECTRICAL DISTRIBUTION SYSTEMS FOR LIGHT AND POWER

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans, Domestic, 80%, per gross ton (carloads).....$120.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....$36.00
Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

(Per Gross Ton, Delivered Lump Size)

50% (carload lots, bulk).....$74.50
50% (ton lots, packed..... 87.00
75% (carload lots, bulk).....135.00
75% (ton lots, packed).....151.00

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)

F.O.B. Jackson, Ohio.....$29.50*
Buffalo $30.75*

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorus or over.

*Official OPACS price established June 24.

Bessemer Ferrosilicon

Prices are $1 a ton above Silvery Iron quotations of comparable analysis.

Ferrochrome

(Per Lb. Contained Cr, Delivered Carlots, Lump Size, on Contract)

4 to 6 carbon.....13.00c.
2 carbon .....19.50c.
1 carbon .....20.50c.
0.10 carbon .....22.50c.
0.06 carbon .....23.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

(Per Gross Ton, Delivered, Lump Size, Bulk, on Contract)

3 carbon $113.00*
2.50 carbon 118.00*
2 carbon 123.00*
1 carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del'd carload.... $2.00
Ferrotungsten, 100 lb. and less $2.25
Ferrovanadium, contract, per lb. contained V, del'd $2.70 to $2.90†
Ferrocolumbium, per lb. contained Cb, f.o.b. Niagara Falls, N. Y., ton lots..... $2.25†
Ferrocarbontitanium, 15-18 Ti, 7-8 C, f.o.b. furnace, carload, contract, net ton.....$142.50
Ferrocarbontitanium, 17-20 Ti, 3-5 C, f.o.b. furnace, carload, contract, net ton.....$157.50
Ferrophosphorus, electric or blast furnace material, carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage freight, equalized with Rockdale, Tenn., gross ton..... $58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage, freight equalized with Nashville, gross ton..... $75.00
Ferromolybdenum, per lb. Mo, f.o.b. furnace ..... 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace..... 80c.
Molybdenum oxide briquettes 48-52 Mo, per lb. contained Mo, f.o.b. Langeloth, Pa.... 80c.
Molybdenum oxide, in cans, per lb. contained Mo, f.o.b. Langeloth, and Washington, Pa. 80c.

*Spot prices are $5 per ton higher.
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores (51.50% Fe.)

(Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer, 51.50.... $4.75
Old range, non-bessemer, 51.50 4.60
Mesaba, bessemer, 51.50..... 4.60
Mesaba, non-bessemer, 51.50... 4.45
High phosphorus, 51.50..... 4.35

Foreign Ores*

(C.i.f. Philadelphia or Baltimore, Exclusive of Duty)

Per Unit

African, Indian, 44-48 Mn..65c. to 66c.
African, Indian, 49-51 Mn..67c. to 69c.
Brazilian, 46-48 Mn.....69c.
Cuban, 51 Mn .....78c.

Per Short Ton Unit

Tungsten, Chinese Wolframite, duty paid, delivered.....$24 to $26
Tungsten, domestic scheelite, at mine .....$24.00 to $25.00
Chrome ore, lump, c.i.f. Atlantic Seaboard, per gross ton; South African (low grade)..Nom.
Rhodesian, 45 .....$32.00
Rhodesian, 48 .....$39.00-$40.00

*Importations no longer readily available. Prices shown are nominal.

COKE*

Furnace

Per Net Ton

Connellsville, prompt ...$6.00 to $6.25

Foundry

Connellsville, prompt ...$6.75 to $7.00

*Maximum coke prices established by OPA became effective Oct. 1, 1941. A complete schedule of the ceiling prices was published in THE IRON AGE, Sept. 25, p. 94B. †F.O.B. oven.

By-product, Chicago $12.25
By-product, New England.....$13.75
By-product, Newark..$12.40 to $12.95
By-product, Philadelphia $12.38
By-product, Cleveland $12.30
By-product, Cincinnati $11.75
By-product, Birmingham .....$8.50†
By-product, St. Louis.....$12.02
By-product, Buffalo $12.50

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton.....$40.00
Angle bars, 100 lb..... 2.70

(F.o.b. Basing Points) *Per Gross Ton*

Light rails (from billets).....$40.00
Light rails (from rail steel)... 39.00

Base per Lb.

Cut spikes ..... 3.00c.
Screw spikes ..... 5.15c.
Tie plates, steel..... 2.15c.
Tie plates, Pacific Coast..... 2.30c.
Track bolts, heat treated, to railroads ..... 5.00c.
Track bolts, jobbers discount.. 63-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneaqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5 f.o.b. Kentucky and Illinois mines, all rail.....$22.00 to $23.00
Domestic, f.o.b. Ohio River landing barges .....22.00 to 23.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines...22.00 to 23.00
Foreign, 85% calcium fluoride, not over 5% Si, c.i.f. Atlantic ports, duty paid.....Nominal
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines.... 31.00
As above, in bags, f.o.b. same mines 32.60

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick *Per 1000*

Super-duty brick, St. Louis...$64.60
First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois 51.30
First quality, New Jersey..... 56.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois 46.55
Second quality, New Jersey.... 51.00
No. 1, Ohio..... 43.00
Ground fire clay, net ton..... 7.60

Silica Brick

Pennsylvania $51.30
Chicago District 58.90
Birmingham 51.30
Silica cement, net ton (Eastern) 9.00

Chrome Brick *Per Net Ton*

Standard, f.o.b. Baltimore, Plymouth Meeting and Chester...$54.00
Chemically bonded, f.o.b. Baltimore, Plymouth Meeting and Chester, Pa. 54.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester $76.00
Chemically bonded, f.o.b. Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Baltimore and Chester in sacks.....$44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) 22.00

360 HOLES AN HOUR

Baush Multiple Spindle Drill Speeds Thrust Bearing Liner Production for Aircraft Engines . . . .

United Aircraft Corporation, makers of the famed Pratt & Whitney Wasp and Hornet engines, are constantly installing new machines to speed up National Defense production. One of the latest installations is the Baush Vertical Hydraulic Multiple Spindle Drilling Machine.

This 38-spindle Baush will be used to drill 24 holes in the thrust bearing liner of the Wasp engine. Although close centering makes it necessary to drill the 24 holes in three stations, the Baush completely drills 15 liners — 45 operations — 360 holes — per hour. And is adaptable to other layouts, quickly set up and tooled for a wide variety of drilling jobs. Furthermore, the Baush machine facilitates accuracy and, by consuming less floor space and freeing man power, contributes to economy of production.



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For over 45 years Baush has pioneered in multiple drilling. Expert engineering service is available. Write, wire or phone today.

MACHINE TOOL CO.
SPRINGFIELD, MASS.

SALES POSSIBILITIES

. . . CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic States

● **Waterbury Tool Co.,** East Aurora Street, Waterbury, Conn., hydraulic transmissions, etc., has let contract to Brown & Matthews, Inc., 122 East Forty-second Street, New York, engineer and contractor, for one-story addition, about 92,000 sq. ft. of floor space, for production of equipment for government. Cost close to $1,400,000 with equipment.

Scott & Williams, Inc., Laconia, N. H., knitting machinery and parts, has let general contract to H. E. Beyster Corp., General Motors Building, Detroit, for new one-story plant near present works for production of aircraft equipment for government. Cost about $609,-300 with machinery, fund to be secured through Defense Plant Corp., Washington.

General Electric Co., Plastics Department, Pittsfield, Mass., plans new one-story plant near local plastics molding works, for production of synthetic phenol, a coal tar acid used for plastics manufacture. Cost about $1,000,-000 with machinery.

Baldwin-Duckworth Chain Belt Co., 369 Plainfield Street, Springfield, Mass., power transmissions, sprockets, etc., has let general contract to Adams & Ruxton Construction Co., 1387 Main Street, for two-story addition, about 42 x 65 ft. Cost close to $40,000 with equipment.

New Haven Clock Co., 133 Hamilton Street, New Haven, Conn., clocks and clock mechanisms, plans two-story addition, about 42 x 140 ft. Cost close to $80,000 with equipment. Leo F. Caproni, 1221 Chapel Street, is architect and engineer.

Pratt & Whitney Division, United Aircraft Corp., East Hartford, Conn., aircraft engines and parts, has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for two one-story additions, each about 80 x 95 ft., for engine-testing units, supplementing a recent award to same contractor for two similar buildings, on which work is under way. Cost over $40,000 with equipment.

Coast Guard Headquarters, Washington, plans new training station and school for petty officers at Avery Point, Groton, Conn., with machine and other mechanical instruction shops. Fund of $1,936,000 has been appropriated for project.

Board of Higher Education, 695 Park Avenue, New York, plans extensions and improvements in power house at Queens College, Flushing, L. I., including additional equipment. Cost over $130,000.

Bendix Aviation Corp., 30 Rockefeller Plaza, New York, aircraft and other precision instruments and parts, plans expansion in branch plants of two divisions, Eclipse Aviation Division and Pioneer Instrument Division, at Bendix and East Orange, N. J.; Laconia, N. H.; Rochester, N. Y.; Philadelphia and Baltimore, for production for government, which will supply fund of $11,816,-000 through Defense Plant Corp., Washington. Of amount noted, approximately $2,900,000 will be expended at Philadelphia plant where company is occupying part of former buildings of Atwater Kent Mfg. Co.; about 120,000 sq. ft. of floor space in previous No. 6 plant will be taken over, providing about 30 per cent increase in present output.

American Locomotive Co., 30 Church Street, New York, has plans by United Engineers & Constructors, Inc., 1401 Arch Street, Philadelphia, for new plant at Twenty-third Street and Euclid Avenue, Chicago Heights, Ill., with boiler house, for production of steel products for government. Fund of about $500,000 will be provided by Defense Plant Corp., Washington.

Consolidated Machine Tool Corp., 565 Blossom Road, Rochester, N. Y., has let general contract to A. Friederich & Sons Co., 710 Lake Avenue, for one-story addition, about 90 x 155 ft. Cost close to $100,000 with equipment. J. F. Ancona, 311 Alexander Street, is engineer.

Pierce Renewable Fuses, Inc., 238 Fourth Street, Buffalo, electric fuses and kindred specialties, has purchased a one-story building at 211 Hertel Avenue for plant, with installation of equipment to double present capacity. Production will be concentrated at new location.

Board of Education, City Hall, Buffalo, James Storer, secretary, asks bids until Nov. 27 for machine tools and other metal-working machinery for vocational schools.

Staynew Filter Corp., 25 Leighton Avenue, Rochester, N. Y., industrial air filters, parts, etc., plans one-story factory, 170 x 250 ft., on local site. Cost close to $180,000 with equipment. S. Firestone, 59 South Avenue, is architect and engineer.

State Purchase Commissioner, State House, West State Street, Trenton, N. J., asks bids until Nov. 24 for galvanized iron screw shackles and galvanized iron split links.

Walter Scott & Co., 525 South Avenue, Plainfield, N. J., printing presses and parts, have let contract to Wigton-Abbott Corp., 1225 South Avenue, for one-story addition, about 80 x 100 ft. Cost close to $60,000 with equipment.

Metalwash Machinery Co., Inc., 27 Haynes Avenue, Newark, N. J., special machinery and parts, has purchased one-story building at 149-51 Shaw Avenue, Irvington, near Newark, for branch plant.

J. Chein & Co., 310 Passaic Avenue, Harrison, N. J., steel toys and kindred products, have let general contract to Roth-Buermann Co., 319 Mount Pleasant Avenue, Newark, N. J., for one-story addition, about 85 x 125 ft. Cost over $65,000 with equipment.

Flood & Conklin Mfg. Co., 132 Chestnut Street, Newark, N. J., paints, varnishes, oils, etc., has leased a one-story building at 334 Lafayette Street for expansion.

New Jersey Power & Light Co., Dover, N. J., plans expansion in steam-electric generating station, including additional equipment. Cost over $500,000 with equipment. E. M. Gilbert Engineering Corp., 412 Washington Street, Reading, Pa., is consulting engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 28 for 10 electric arc welding sets for Philadelphia Navy Yard; also for 68 similar welding sets at yards at Brooklyn, Charleston, S. C., and Mare Island, Cal. (Schedule 9394).

American Swedo Iron Co., Harrison Building, Philadelphia, plans one-story addition to plant at Danville, Pa., for increased capacity. Cost over $50,000 with equipment.

Bureau of Yards and Docks, Navy Department, Washington, closes bids Nov. 26 for electric traveling bridge crane for Philadelphia Navy Yard, and for similar cranes for yards at Charleston, S. C., and Pearl Harbor, T. H.; Roosevelt Base, Terminal Island, Cal.; naval submarine base, St. Thomas, V. I.; and naval air station, Coco Solo, Canal Zone (Specification 10643).

Hygrade Sylvania Corp., St. Marys, Pa., electric lamps, radio tubes, etc., plans new one-story plant, about 50,000 sq. ft. of floor space, on 16-acre tract near Williamsport, Pa. Facilities will be installed for employment of about 500 persons. Cost close to $500,000 with machinery. Main offices are at Salem, Mass.

Westinghouse Electric & Mfg. Co., East Pittsburgh, will begin superstructure soon for new one and multi-story plant at Fairmont, W. Va., adjoining recently completed glass-manufacturing works at that place. New unit will be equipped for production of glass tubing for fluorescent lighting, special electronic control devices for government, and kindred specialties. Cost over $1,500,000 with equipment.

Purchasing and Contracting Officer, Air Corps, Middletown Air Depot, Middletown, Pa., asks bids until Nov. 24 for 547,000 ft. of rubber-covered wire, 20,000 ft. of lead-covered cable, 40,000 ft. of bare copper wire, 38,000 galvanized conduit locknuts, galvanized elbows, conduit reducers and other equipment (Circular 562 AC 42-5).

Maryland Dry Dock Co., Fairfield, Baltimore, has asked bids on general contract for one-story pipe and electric shops. Cost over $100,000 with equipment. This is part of expansion and improvement program being carried out at plant, to cost about $5,000,000. J. E. Greiner Co., 1201 St. Paul Street, is consulting engineer.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until Dec. 3 for wind tunnel and construction shop at naval experimental model basin, Carderock, Md., including air-conditioning system, etc. (Specification 10542).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 25 for six motor-driven, floor-type, horizontal boring, drilling and milling machines for Philadelphia, Hunters Point, Cal., and Mare Island yards (Schedule 9382); plow steel galvanized wire rope for Brooklyn and San Diego yards (Schedule 9389).

The South

● **Shell Oil Co.,** Shell Building, St. Louis, plans new bulk storage and distributing plant at Federal Volunteer Ordnance Works, near Chattanooga, Tenn., including pumping station, steel storage tanks for capacity of 1,050,000 gal. of standard gasoline, and 210,-000 gal. of aviation gasoline, loading facilities, etc. Cost about $125,000.

Gum Turpentine Farmers' Cooperative Association, Vidalia, Ga., plans new turpentine distillation plant, with storage and distribution buildings. Cost about $144,000 with equipment. Fund in that amount has been secured through Federal aid for project.

Virginia Public Service Co., Farmville, Va., plans rebuilding auxiliary steam-electric power plant, recently destroyed by fire. Loss close to $250,000 with equipment. Main offices are at Alexandria, Va.

Intercontinent Aircraft Corp., Miami, Fla., airplanes and parts, plans expansion, comprising several one-story structures for parts manufacture and assembling. Cost about $600,-000. Loan in that amount has been arranged through RFC for project.

Stanolind Oil & Gas Co., Philcade Building, Tulsa, Okla., has let general contract to Waller-Wells Construction Co., 2423 East Thirteenth Place, for three one-story additions to oil plant at 1136 North Lewis Avenue, 36 x 100 ft., 50 x 70 ft., and 35 x 80 ft., for production division, laboratory and other technical service. Cost close to $140,000 with equipment.

Troy Whitehead Machinery Co., Wilkinson Boulevard, Charlotte, N. C., plans one-story addition, about 80 x 120 ft., for storage and distribution. Cost about $40,000 with equipment.

National Butane Gas Co., 2147 Frisco Street, Memphis, Tenn., plans rebuilding one-story mechanical shops at plant, recently destroyed by fire. Loss close to $50,000 with equipment.

Light and Water Department, Sebring, Fla., plans extensions and improvements in municipal power plant and electrical distribution system. Cost about $65,000. Fund in that amount will be secured through Federal aid.

Chemical Warfare Service, Edgewood Arsenal, Edgewood, Md., will prepare plans for new bomb-assembling plant for War Department, Washington, on 5000-acre tract in Jefferson County, near Pine Bluff, Ark. It will comprise one and multi-story production and assembling units, chemical warfare building storage and distribution structures, mechanical shops, laboratories, administration building

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and other structures, totaling about 1,000,000 sq. ft. of floor space in all. Plant will have rated output of about 3,000,000 bombs per month; primary parts will be manufactured at outside plants and shipped to new works for assembling. Cost about $36,000,000. Of this amount, fund of $10,000,000 has been authorized for immediate work, including land acquisition.

Lone Star Cement Corp., Mellie Esperson Building, Houston, Tex., has let general contract to Tellepson Construction Co., 3900 Clay Street, for expansion in storage and distributing department, and for one-story compressor house and scale building at local plant. Cost close to $50,000 with equipment.

Gulf Refining Co., Gulf Building, Houston, Tex., plans expansion in gasoline division at oil refinery at Fort Arthur, Tex., for increased production of high-test gasoline for aviation service. Cost over $200,000 with equipment.

Central States

● **American Welding & Mfg. Co.**, Griswold Street, Warren, Ohio, welded tanks, etc., has let general contract to Brown Construction Co., 1900 Euclid Avenue, Cleveland, for one-story addition, about 175 x 260 ft.; also has asked bids on general contract for one-story extension, about 40 x 350 ft. Both units will be equipped for production of tank parts for government, for which fund of $484,000 will be furnished by Defense Plant Corp., Washington. Wallace W. Leipner, 700 Prospect Street, Cleveland, is consulting engineer.

Univis Lens Co., Leo Street, Dayton, Ohio, goggles, safety glasses and other optical products, plans one-story addition, 110 x 250 ft. Cost close to $100,000 with equipment. Geyer & Neuffer, Ludlow Arcade Building, are architects.

Queen City Steel-Treating Co., 2980 Spring Grove Avenue, Cincinnati, has let general contract to Meyer-Hecht Co., 2814 Stanton Avenue, for one-story addition, about 90 x 90 ft., for expansion in machine shop. Cost close to $40,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects.

Atmospheric Nitrogen Co., subsidiary of Allied Chemical & Dye Corp., 61 Broadway, New York, has arranged with government for supervision of erection and operation of new synthetic ammonia and ammonium nitrate works at South Point, Ohio, about four miles from Ashland, Ky., where about 1000-acre tract is being acquired. Plant will comprise one and multi-story processing and production units, with auxiliary buildings, steam power plant, machine shops, and other structures. It will cost about $20,000,000, instead of smaller sum previously noted, and will be known as Buckeye Ordnance Works. Fund will be provided by Defense Plant Corp., Washington.

Jordan Welding & Mfg. Co., 9428 Cassius Street, Cleveland, has let general contract to H. I. Dolin, 9916 South Boulevard, for one-story addition, 40 x 120 ft., with extension 40 x 90 ft., for expansion in forge shop and welding department. Cost close to $50,000 with equipment.

International Vibration Co., 16702 Waterloo Road, Cleveland, plans rebuilding plant recently destroyed by fire, with loss reported over $150,000 with equipment.

United States Plastic Insulation Co., Wabash Ind., will remodel property on North Ninth Street, fronting on Pennsylvania Railroad, Elwood, Ind., consisting of several one-story buildings, for branch plant. Cost close to $50,000 with equipment.

War Department, Twentieth Street and Constitution Avenue, N. W., Washington, has plans for military airport at Kokomo, Ind., where about 360 acres will be furnished by city. Work will include hangars, repair and reconditioning shops, and other operating buildings, administration building, etc. Cost about $500,000. United States Engineer Office, Louisville, will be in charge.

American Thermometer Co., 2917 Clark Avenue, St. Louis, precision instruments and equipment, has let general contract to William H. & Nelson Cunliff Co., 3320 Lindell Street, for one-story addition, about 135 x 150 ft., at 205 South Ewing Avenue, for production of ordnance for government. Cost over $125,000 with equipment.

St. Louis County Hospital, 601 Brentwood Boulevard, St. Louis, plans addition to power house at North and South Roads, Clayton, Mo., in connection with new multi-story health center building. Additional equipment will be installed, including boiler unit and accessories. Fund of $522,500 has been secured through Federal aid for entire project. William B. Ittner, Board of Education Building, St. Louis, is architect and engineer.

Stearman Aircraft Division, Boeing Airplane Co., Wichita, Kan., plans extensions for production of aircraft for government. Cost about $125,000. Financing will be provided by Defense Plant Corp., Washington.

Odel Tool & Die Co., 8820 Grinnell Street, Detroit, dies, gages, tools, etc., has let general contract to Stibbard Construction Co., 3000 Grand River Boulevard, for one-story addition. Cost close to $45,000 with equipment. Frank Eurich, Jr., Detroit Savings Bank Building, is architect.

Chrysler Corporation, 341 Massachusetts Avenue, Detroit, has concluded agreement with War Department for expansion in military tank arsenal, 28251 Van Dyke Street, to double present capacity. Fund of $18,875,000 will be furnished by Defense Plant Corp. for buildings and machinery. Company also has arranged for lease of section of local plant of Hupp Motor Car Corp., 3641 East Milwaukee Street, totaling 215,500 sq. ft. of floor space, for expansion in automobile and other lines of production.

Fisher Body Division, General Motors Corp., Detroit, is selecting site at Whigville, near Flint, Mich., for new plant for production of military tanks for government, consisting of main one and part multi-story unit, and smaller buildings. Cost about $25,782,000 with equipment. Of this amount, approximately $20,950,000 will be used for equipment, and remainder for site and buildings. Fund will be furnished by Defense Plant Corp., Washington.

Hammer Tool & Die Co., Inc., 17230 Mount Elliott Avenue, Detroit, has let general contract to Ernest Artt, 8812 Kercheval Avenue, for one-story addition. Cost close to $40,000 with equipment. H. D. Ilgenfritz, 468 Prentis Street, is architect.

Hills-McCanna Co., 2349 West Nelson Street, Chicago, lubricators, valves and other engineering products, has let general contract to Wendnagel Co., 600 West Cermak Road, for one-story addition, 52 x 159 ft., for extensions in machine shop and metal-cleaning department. Cost over $65,000 with equipment. Morton L. Pereira & Associates, 100 West Monroe Street, are architects.

Illinois Northern Utilities Co., Dixon, Ill., plans expansion in local steam-electric generating station, to include new 50,000-kw. turbine generator unit and accessories, high-pressure boilers and auxiliary equipment. New boiler house will be built. Also will extend switchyard and make additions to transmission system. Cost about $6,000,000. Work is scheduled for completion in 1943. Sargent & Lundy, Inc., 140 South Dearborn Street, Chicago, is consulting engineer.

Trackson Co., 3333 South Chase Avenue, Milwaukee, tractor equipment, cranes, crawlers, etc., has let general contract to Selzer-Ornst Co., 6222 West State Street, for one-story addition, about 70 x 75 ft. Cost close to $40,000 with equipment.

Howard Aircraft, Inc., 5301 West Sixty-fifth Street, Summit, Ill., plans new one-story plant at St. Charles, Ill., for parts production and assembling. Estimates of cost are being made. Loewenberg & Loewenberg, 111 West Monroe Street, Chicago, are architects.

Jacob E. Decker & Sons, Inc., 320 Fifteenth Street, N. E., Mason City, Iowa, meat packer, division of Armour & Co., has let general contract to Rye & Henkel Construction Co., Inc., 523 Ninth Street, S. E., for one-story and basement addition, 120 x 120 ft., for expansion in processing and canning divisions. Cost close to $100,000 with equipment.

R. Krasberg & Sons Mfg. Co., Inc., 925 West Wrightwood Avenue, Chicago, special machinery, parts, tools, etc., has let general contract to Arthur E. Nelson, 1244 East Seventy-ninth Street, for new one-story plant, 82 x 185 ft., at Campbell Avenue and Homer Street. Cost over $80,000 with equipment. Engineering Systems, Inc., 221 North La Salle Street, is architect and engineer.

Superior Iron Works Co., Lamberton Avenue, Superior, Wis., plans one-story addition for expansion in machine shops. Cost close to $40,000 with equipment. Roland C. Buck, Inc., 1223 Tower Avenue, is architect and engineer.

Western States

● **Oregon Steel Foundry Co.**, 2515 N. W. Twenty-eighth Street, Portland, Ore., steel castings, has let general contract to M. F. Dodge, 513 Willamette Street, Oregon City, Ore., for new one-story plant, 78 x 134 ft., to replace foundry recently destroyed by fire. An overhead traveling crane will be installed. Cost close to $60,000 with equipment. Howard L. Gifford, Railway Exchange Building, is architect.

Douglas Aircraft Co., Inc., Santa Monica, Cal., has let general contract to Alco Construction Co., 5423 Flemish Village Lane, Los Angeles, for three one-story additions, 230 x 300 ft., 24 x 2400 ft., and 30 x 100 ft., first two noted to be used for storage and distribution, and latter for office and operating service. Cost over $150,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architect and engineer.

United States Engineer Office, 751 South Figueroa Street, Los Angeles, asks bids until Nov. 26 for two oil-pumping units, with equipment and accessories, for Santa Fe dam (Circular 119).

Board of Contracts and Awards, City Hall, Tacoma, Wash., asks bids until Nov. 24 for equipment for two new hydroelectric generating stations on Nisqually River, comprising two 34,500-hp. hydraulic turbines and two 25,000-kw. electric generators, for Alder power station; and one 55,000-hp. hydraulic turbine and one 40,000-kw. electric generator for La Grande power plant. Project will include new 110,000-volt transmission line, about 34 miles long, and terminal power substation at city limits, for which bids will be asked later. Entire development will cost close to $11,000,000.

National Supply Co., 1524 Border Avenue, Torrance, Cal., oil and gas well equipment and supplies, engines, etc., has let general contract to Pozzo Construction Co., 2403 Riverside Drive, Los Angeles, for one-story addition, about 65,000 sq. ft. of floor space. Cost over $175,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architect and engineer.

Albina Engine & Machine Works, 1101 N. E. River Street, Portland, Ore., has let general contract to Frank C. Ralph, 5949 N. W. Twenty-fourth Street, for one-story addition. Cost close to $40,000 with equipment.

Canada

● **Callander Foundry Co.**, Omar Street, Guelph, Ont., iron and other metal castings, has approved plans for one-story addition, 90 x 120 ft., for expansion in main foundry. Cost close to $75,000 with equipment.

City Council, Medicine Hat, Alta., plans extensions and improvements in municipal power plant, with installation of generating and auxiliary equipment. Cost over $250,000 with equipment. H. O. Davis is general superintendent.

Canadian General Electric Co., Ltd., Park Street, Peterboro, Ont., will begin work at once on one-story addition, for which general contract recently was let to A. W. Robertson, Ltd., 57 Bloor Street West, Toronto. Cost close to $450,000 with equipment. John M. Lyle, 230 Bloor Street West, Toronto, is architect.